

Project: I-5898

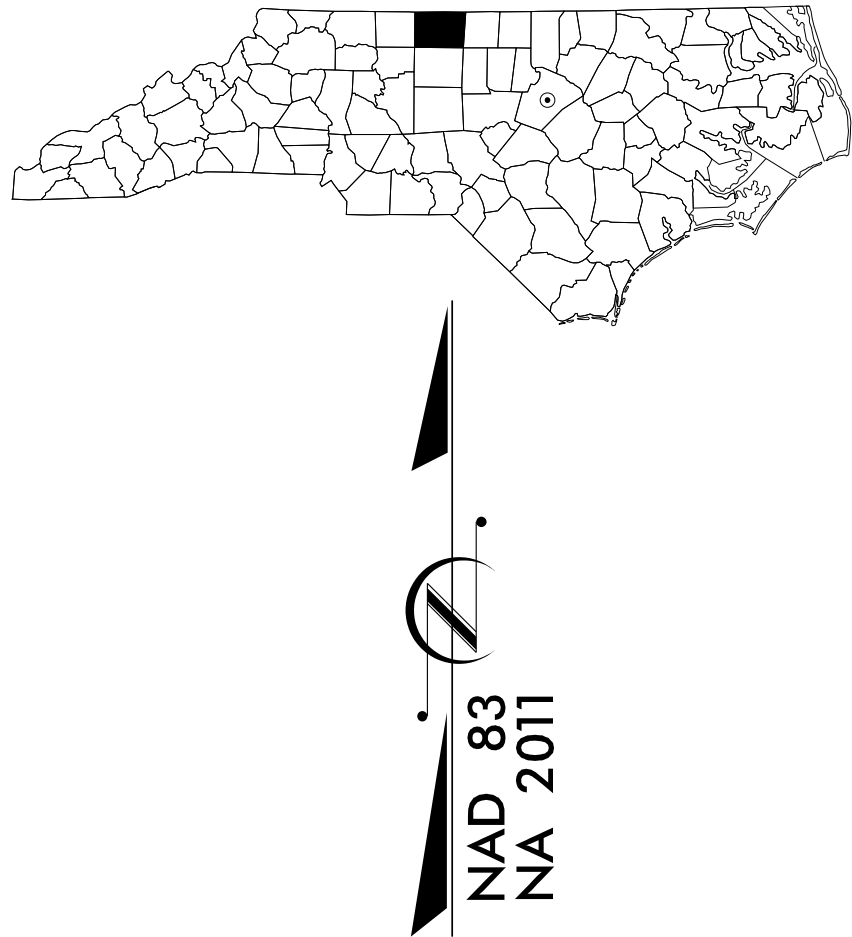
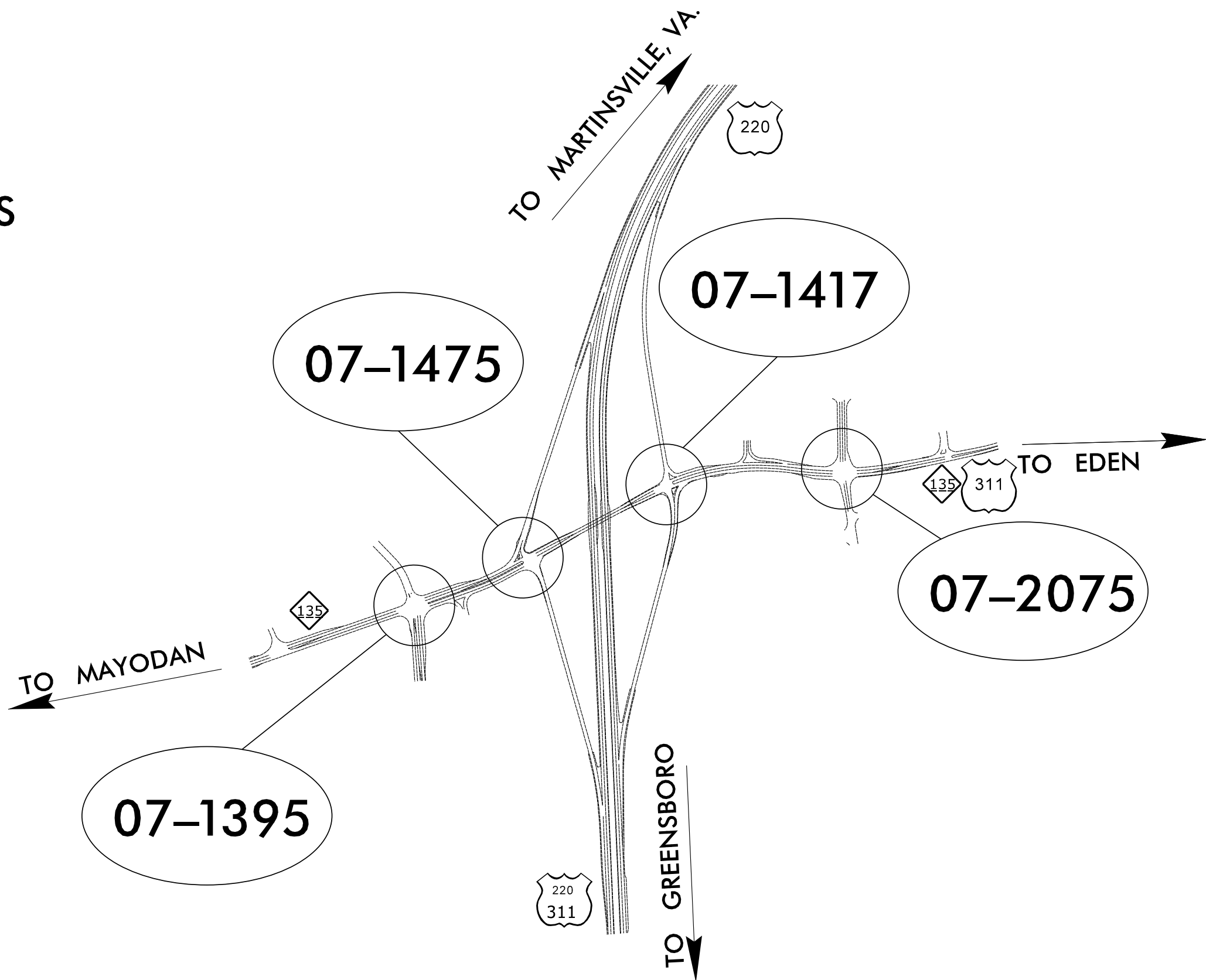
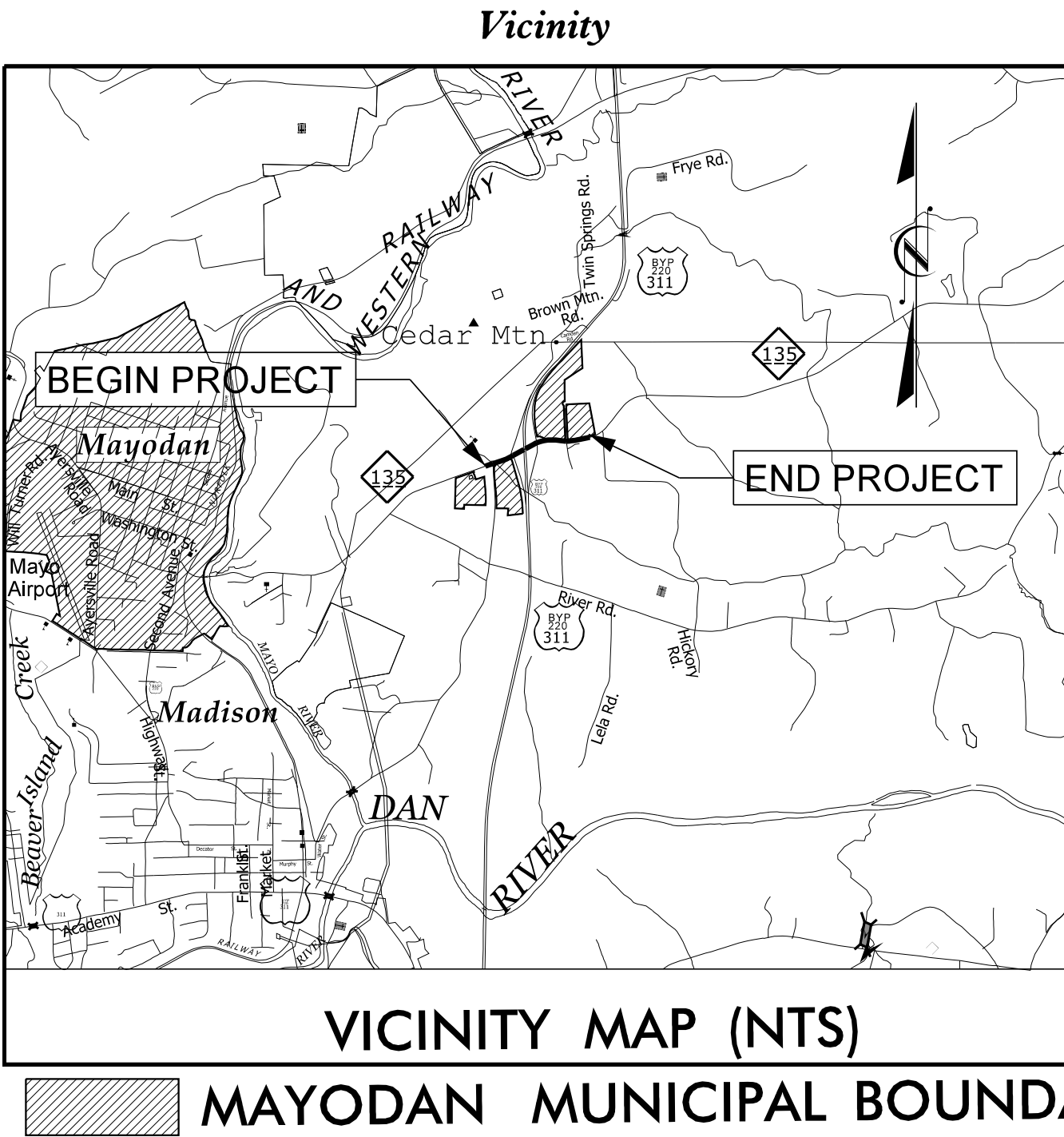
Contract: C205018

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ROCKINGHAM COUNTY

LOCATION: US 311 / NC 135 AT US 220 INTERCHANGE

TYPE OF WORK: TRAFFIC SIGNALS



Refer to "Roadway Standard Drawings
NCDOT" dated January 2024 and
"Standard Specifications for Roads
and Structures" dated January 2024.

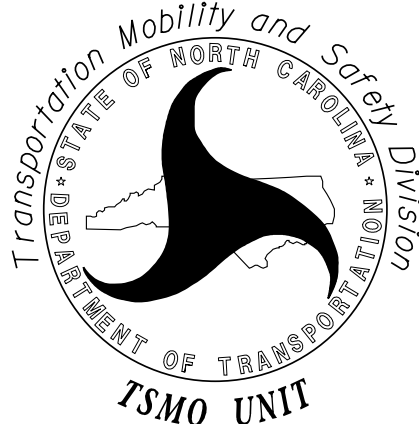
Sheet #	Reference #	Index of Plans	Location/Description
Sig. 1.0	N/A	Title Sheet	
Sig. 2.0-6.2	07-1395	NC 135 at SR 2177 (Dan Valley Road) and McMichael High School	
Sig. 7.0-11.1	07-1475	US 311/NC 135 at US 220 Southbound Ramps	
Sig. 12.0-15.2	07-1417	US 311/NC 135 at US 220 Northbound Ramps	
Sig. 16.0-19.2	07-2075	US 311/NC 135 at SR 2271 (Shakey Road) and SR 2283 (Commerce Drive)	
Sig. M1A-M9	N/A	Metal Pole Standard Drawings	

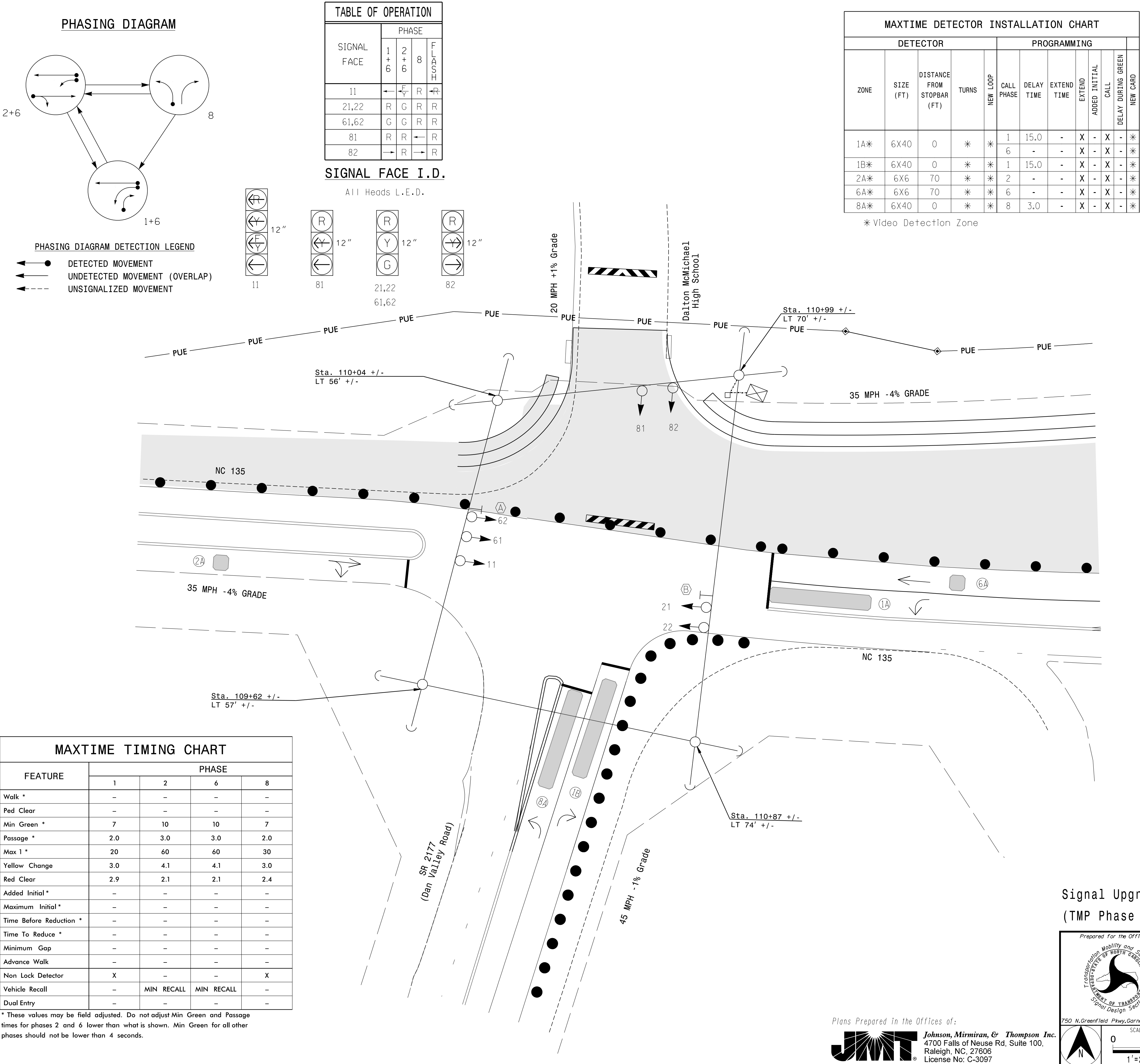
TRANSPORTATION SYSTEMS
MANAGEMENT & OPERATIONS UNIT

Contacts:

Robert J. Ziemba, PE, CPM - Central Region Signals Engineer
Keith M. Mims, PE - Signal Equipment Design Engineer

Prepared for the Office of:
DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY & SAFETY DIVISION





PROJECT REFERENCE NO.	SHEET NO.
I-5898	2.0

3 Phase
Fully Actuated
(NC 135 CLS)
Signal System #: D07-09_Mayodan

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 may be lagged.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- This intersection uses video detection. Install detectors according to the manufacturer's instruction to achieve the desired detection.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Install department-furnished cellular modem and antenna for remote communications. Request cell modem from the Engineer at least 8 weeks before anticipated deployment.

LEGEND

PROPOSED	EXISTING
	N/A
	N/A
N/A	Right of Way
N/A	Permanent Utility Easement

Signal Upgrade - Temporary Design 1
(TMP Phase II)

Prepared for the Offices of:

NC135
at
SR 2177 (Dan Valley Road) and
McMichael High School

Division 7 Rockingham County Mayodan

PLAN DATE: August 2025 REVIEWED BY: Golam Moynuddin

PREPARED BY: Jamal Khdeir REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

Signed by:

62897C8827ED4EC 8/1/2025

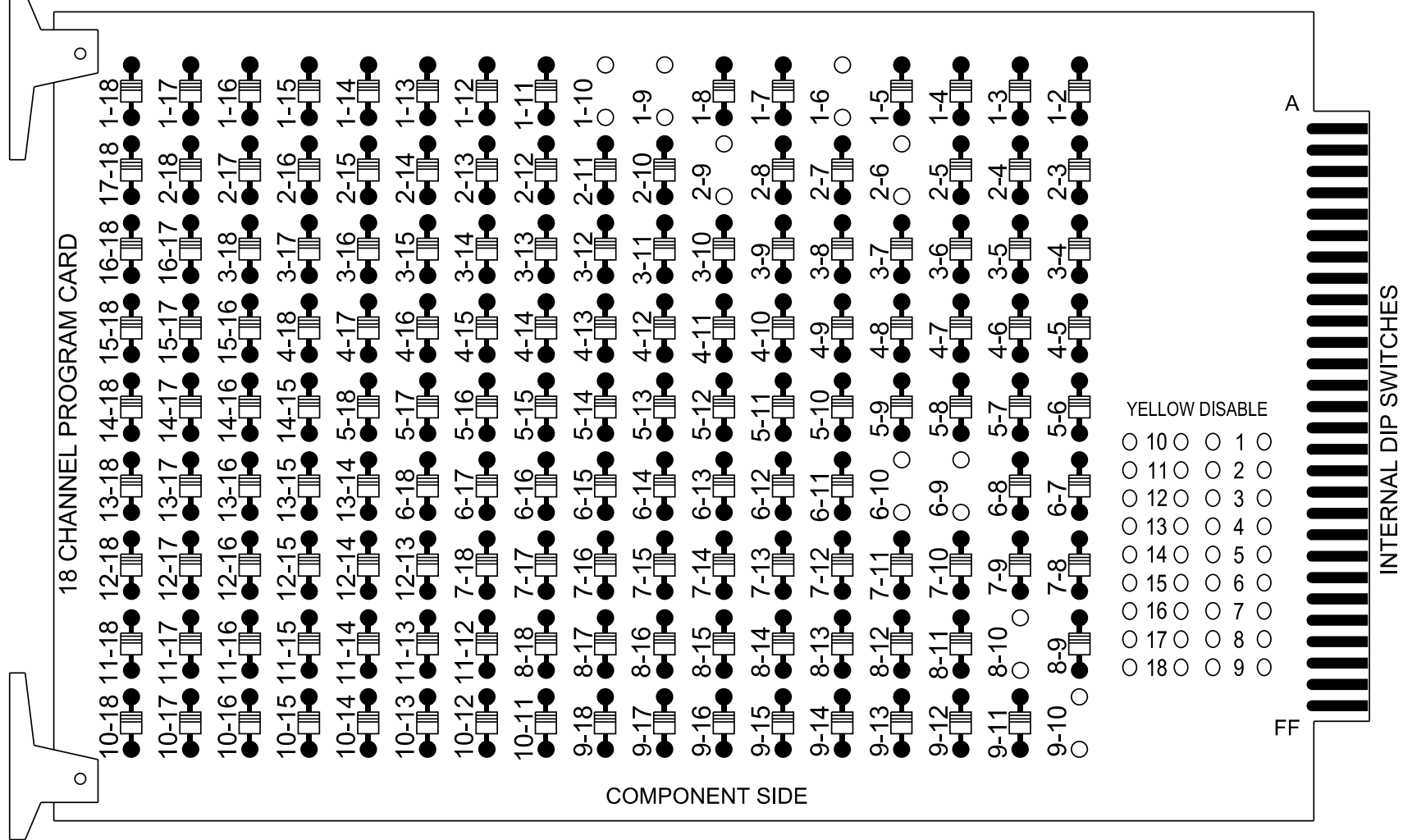
SIGNATURE DATE

SIG. INVENTORY NO. 07-1395 TI

18 CHANNEL CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

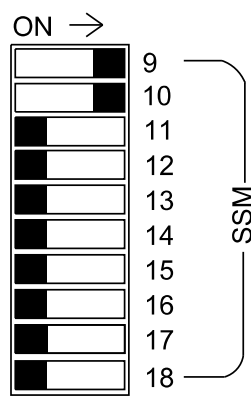
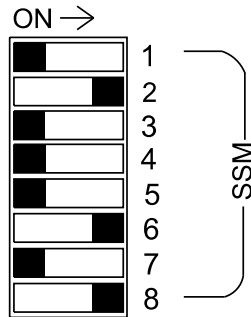
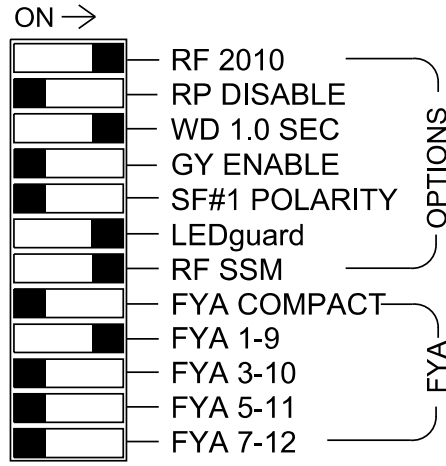
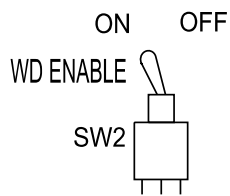
REMOVE DIODE JUMPERS 1-6, 1-9, 1-10, 2-6, 2-9, 6-9, 6-10, 8-10 and 9-10.



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that the Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.



■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
3. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
4. The cabinet and controller are part of the Signal System #: D07-09_Mayodan

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S1, S2, S8, S11, AUX S1, AUX S2
Phases Used.....1, 2, 6, 8
Overlap "1".....*
Overlap "2".....*
Overlap "3".....NOT USED
Overlap "4".....NOT USED

*See overlap programming detail

SIGNAL HEAD HOOK-UP CHART

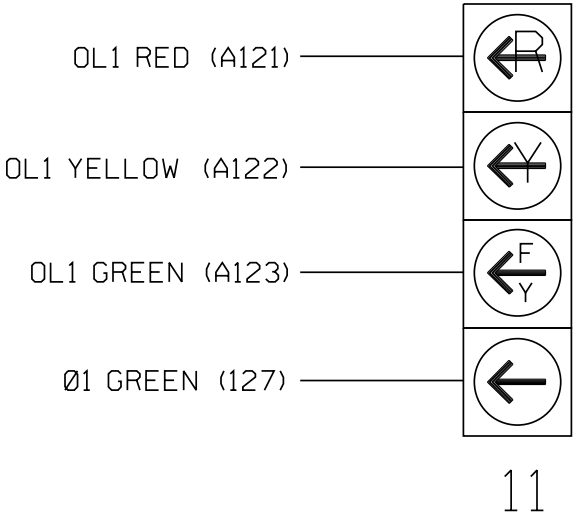
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	11★	21,22	NU	NU	NU	NU	NU	61,62	NU	NU	81	NU	11★	82	NU	NU	NU	NU
RED		128						134			107			A124				
YELLOW	★	129						135										
GREEN		130						136										
RED ARROW													A121					
YELLOW ARROW											108		A122	A125				
FLASHING YELLOW ARROW													A123					
GREEN ARROW	127										109			A126				

NU = Not Used

- * Denotes install load resistor. See load resistor installation detail this sheet.
★ See pictorial of head wiring in detail this sheet.

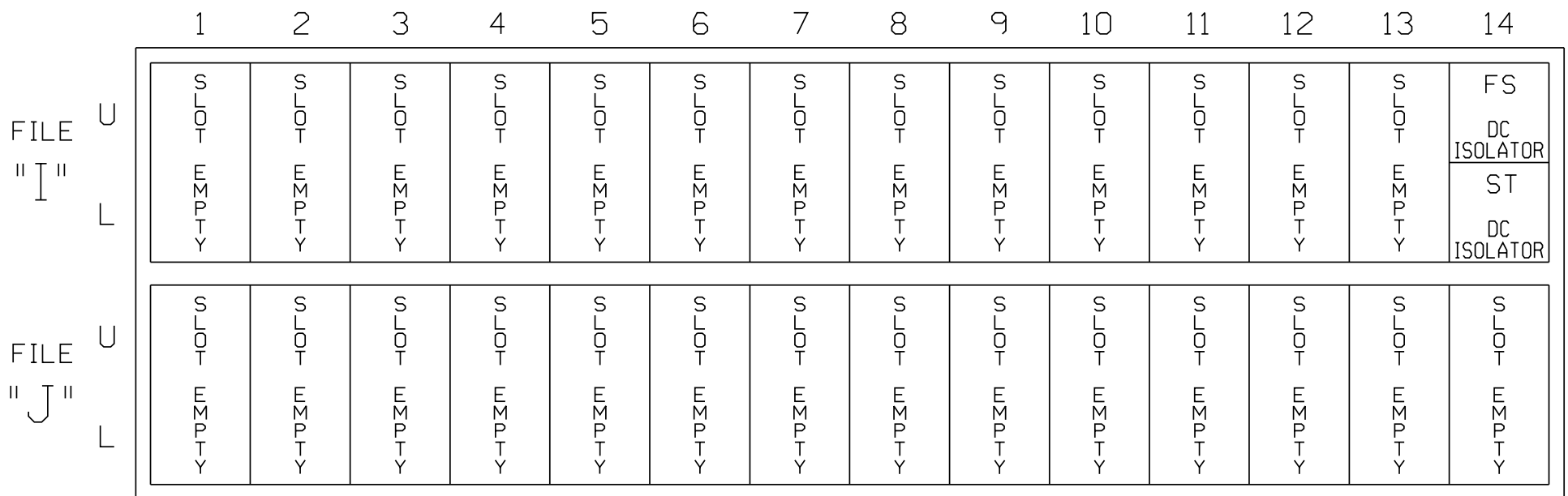
FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE POSITION LAYOUT

(front view)



EX. : 1A, 2A, ETC. = LOOP NO.'S

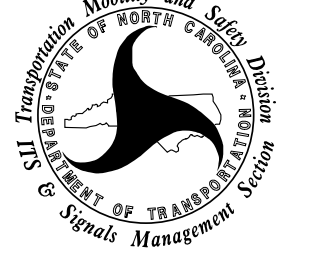
FS = FLASH SENSE
ST = STOP TIME

SPECIAL DETECTOR NOTE

Install a video detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1395T1
DESIGNED: August 2025
SEALED: 8/1/2025
REVISED: N/A

Signal Upgrade - Temporary Design 1 (TMP Phase II)
Electrical Detail - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:		NC 135 at SR 2177 (Dan Valley Road) and McMichael High School		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared for the Offices of:  750 N. Greenfield Pkwy, Corner, NC 27529		Division 7 Rockingham County Wayodan		SEAL NORTH CAROLINA PROFESSIONAL SEAL 034454 ENGINEER GOLAM MOINUDDIN	
PLAN DATE: August 2025		REVIEWED BY:		Signed by:  02897CB827ED4EC	
PREPARED BY: Golam Moinuddin		REVIEWED BY:		DATE: 8/1/2025	
REVISIONS		INIT.		DATE	
				SIG. INVENTORY NO. 07-1395 T1	

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Overlap Plan 1

Overlap	1	2
Type	FYA 4 - Section	Normal
Included Phases	2	1,8
Modifier Phases	1	-
Modifier Overlaps	-	-
Trail Green	0	0
Trail Yellow	0.0	0.0
Trail Red	0.0	0.0

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

Front Panel
Main Menu >Controller >Unit

Web Interface
Home > Controller > Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

IN ORDER TO INSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

1. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
2. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
3. REMOVE FLASHER UNIT 2.

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

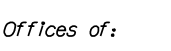
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1395T1
DESIGNED: August 2025
SEALED: 8/1/2025
REVISED: N/A

Signal Upgrade - Temporary Design 1 (TMP Phase II)
Electrical Detail - Sheet 2 of 2

**DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED**

Prepared in the Offices of:

JMT *Johnson, Mirmiran, & Thompson Inc.*
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27606
License No: C-3097

ELECTRICAL AND PROGRAMMING DETAILS FOR:	NC 135 at SR 2177 (Dan Valley Road) and McMichael High School	SEAL 																																					
Prepared for the Offices of:  Department of Transportation & Signal Management System	Division 7 Rockingham County Mayodan <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">PLAN DATE: August 2025</td> <td style="width: 50%;">REVIEWED BY:</td> </tr> <tr> <td>PREPARED BY: Golam Moinuddin</td> <td>REVIEWED BY: _____</td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">REVISONS</th> <th style="width: 20%;">INIT.</th> <th style="width: 20%;">DATE</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>		PLAN DATE: August 2025	REVIEWED BY:	PREPARED BY: Golam Moinuddin	REVIEWED BY: _____	REVISONS	INIT.	DATE																														
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750 N.Greenfield Pkwy,Garner, NC 27529	Signed by: <u>Golam Moinuddin</u> 92897CB82704EAC 8/1/2025 DATE SIG. INVENTORY NO. 07-1395 T1																																						

PROJECT REFERENCE NO.	SHEET NO.
I-5898	3.0

6 Phase
Fully Actuated
(NC 135 CLS)
Signal System #: D07-09_Mayodan

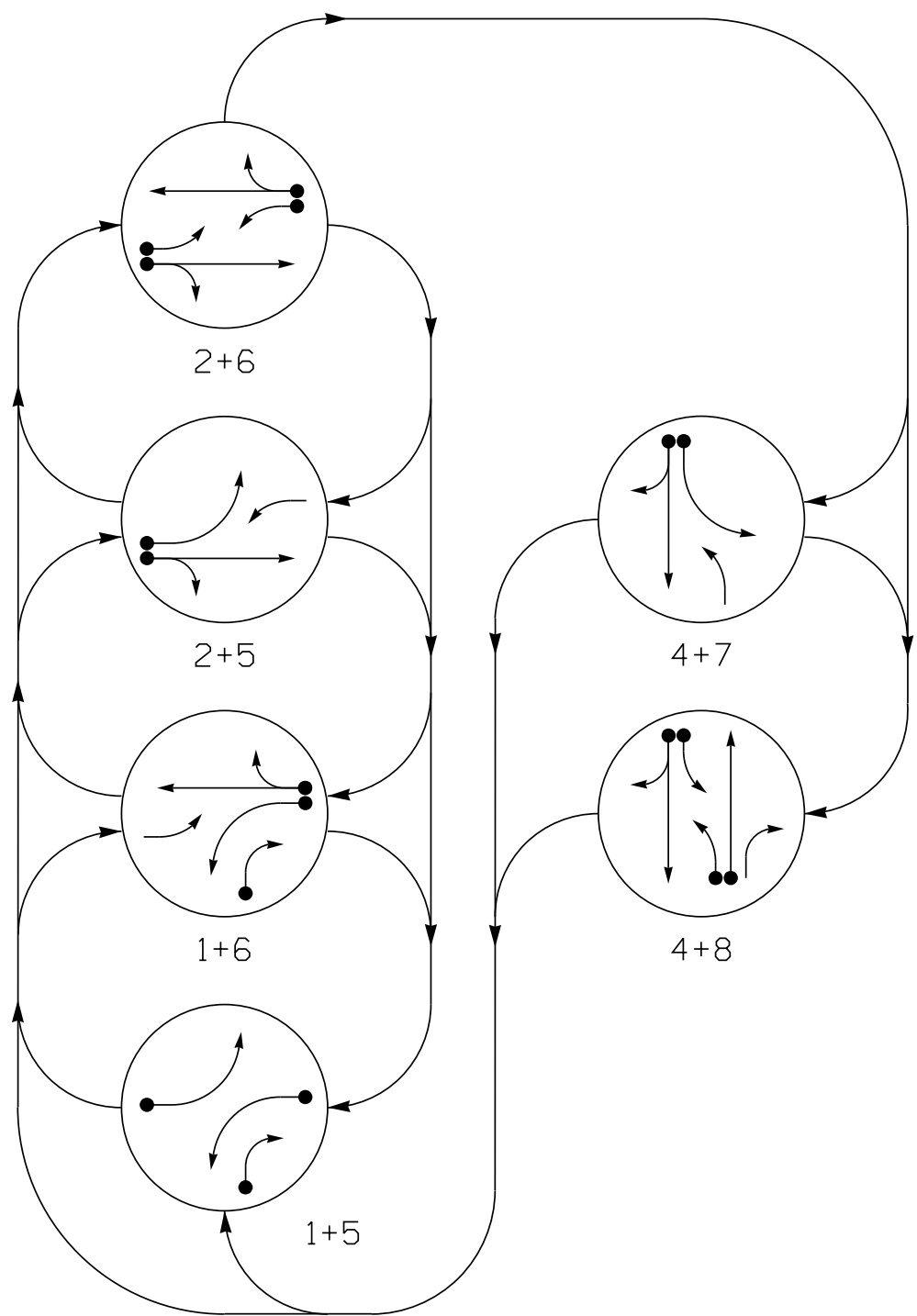
NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase land phase 5 may be lagged.
- Phase 7 may be lagged.
- Set all detector units to presence mode.
- Remove existing turn prohibition (R3-land R3-2) signs.
- This intersection uses video detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signalsystem timing values supersede these values.

LEGEND

PROPOSED	EXISTING

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

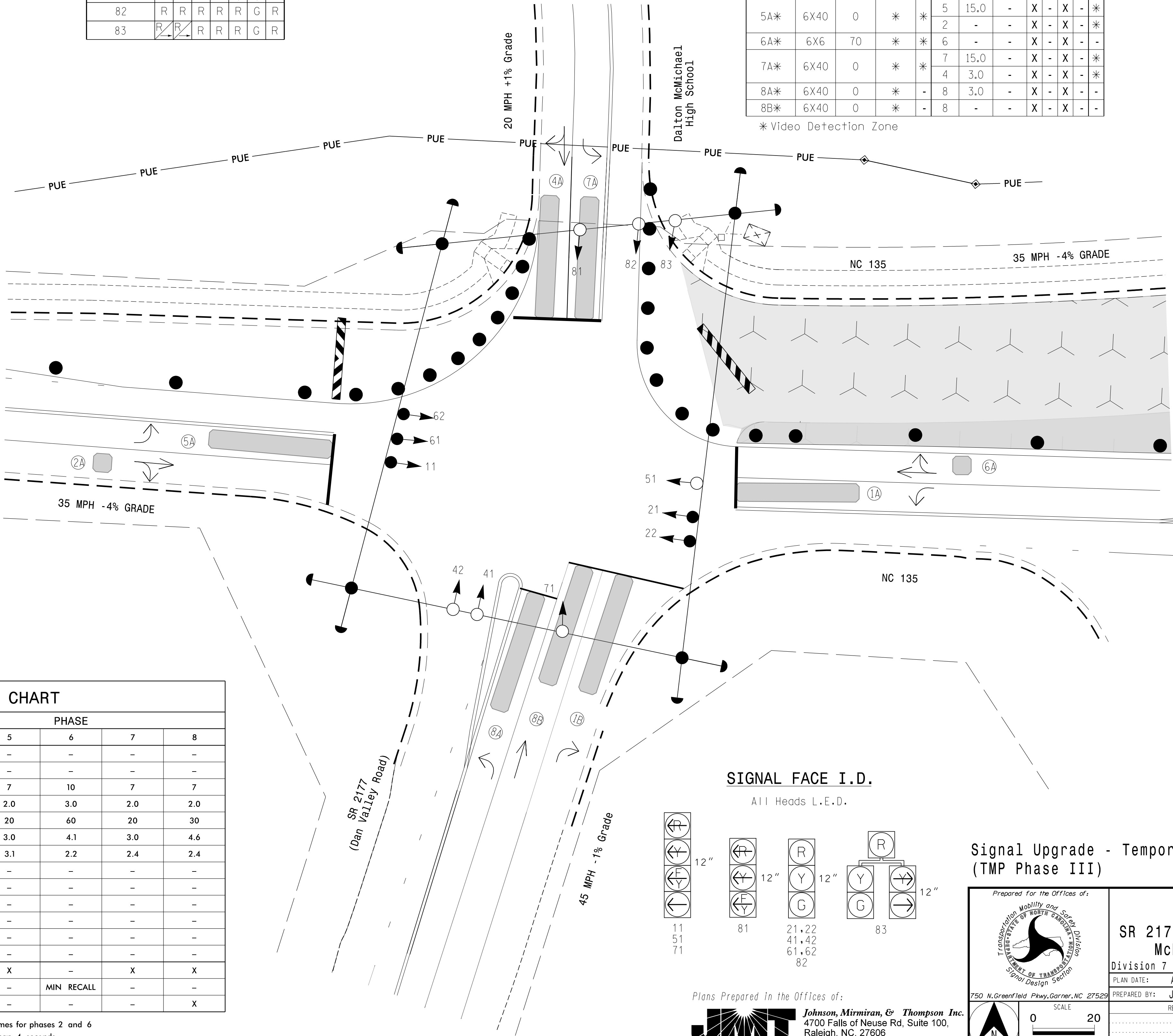
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT

SIGNAL FACE	PHASE						
	1+5	1+6	2+5	2+6	4+7	4+8	F
11	←	←	←	←	←	←	←
21,22	R	R	G	G	R	R	R
41,42	R	R	R	R	G	G	R
51	←	←	←	←	←	←	←
61,62	R	R	G	G	R	R	R
71	←	←	←	←	←	←	←
81	←	←	←	←	←	←	←
82	R	R	R	R	G	G	R
83	R	R	R	R	G	G	R

MAXTIME DETECTOR INSTALLATION CHART

DETECTOR				PROGRAMMING						
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL DURING GREEN
1A*	6X40	0	*	*	1	15.0	-	X	-	X
1B*	6X40	0	*	*	6	-	-	X	-	X
2A*	6X6	70	*	*	2	-	-	X	-	X
4A*	6X40	0	*	-	4	10.0	-	X	-	X
5A*	6X40	0	*	*	5	15.0	-	X	-	X
6A*	6X6	70	*	*	2	-	-	X	-	X
7A*	6X40	0	*	*	7	15.0	-	X	-	X
8A*	6X40	0	*	-	8	3.0	-	X	-	X
8B*	6X40	0	*	-	8	-	-	X	-	X

* Video Detection Zone



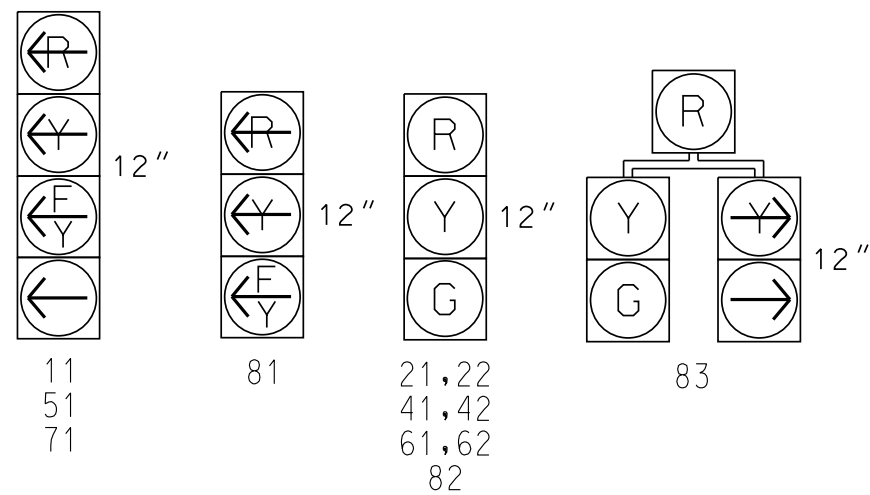
MAXTIME TIMING CHART

FEATURE	PHASE						
	1	2	4	5	6	7	8
Walk *	-	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-	-
Min Green *	7	10	7	7	10	7	7
Passage *	2.0	3.0	2.0	2.0	3.0	2.0	2.0
Max 1 *	20	60	30	20	60	20	30
Yellow Change	3.0	4.1	4.6	3.0	4.1	3.0	4.6
Red Clear	2.6	2.2	2.4	3.1	2.2	2.4	2.4
Added Initial *	-	-	-	-	-	-	-
Maximum Initial *	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-
Advance Walk	-	-	-	-	-	-	-
Non Lock Detector	X	-	X	X	-	X	X
Vehicle Recall	-	MIN RECALL	-	-	MIN RECALL	-	-
Dual Entry	-	-	X	-	-	-	X

* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

SIGNAL FACE I.D.

All Heads L.E.D.



Signal Upgrade - Temporary Design 2
(TMP Phase III)

Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

NC 135
at
SR 2177 (Dan Valley Road) and
McMichael High School
Division 7 Rockingham County Mayodan

PLAN DATE: August 2025
PREPARED BY: Jamal Khdeir
REVIEWED BY: Golam Moynuddin

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Signed by:
8/1/2025
DATE

CT REFERENCE NO.	SHEET NO.
I-5898	Sig 3.2

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Home >Controller >Advanced IO>Channels>Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

IN ORDER TO INSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

- THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Home >Controller >Overlap Configuration >Overlaps

Overlap	1	2	3	4
Type	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section
Included Phases	2	4	6	8
Modifier Phases	1	-	5	7
Modifier Overlaps	-	-	-	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

Signal Upgrade - Temporary Design 2 (TMP Phase III)
Electrical Detail - Sheet 2 of 2

SEAL

NORTH CAROLINA
PROFESSIONAL
SEAL
034454
ENGINEER
GOLAN M. MONUDDIN

Signed by: Golan Monuddin

62897CB827E04FC

8/1/2025
DATE

SIG. INVENTORY NO. 07-1395 T2



Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27606
License No: C-3097

ELECTRICAL AND PROGRAMMING
DETAILS FOR:

Prepared for the Offices of:



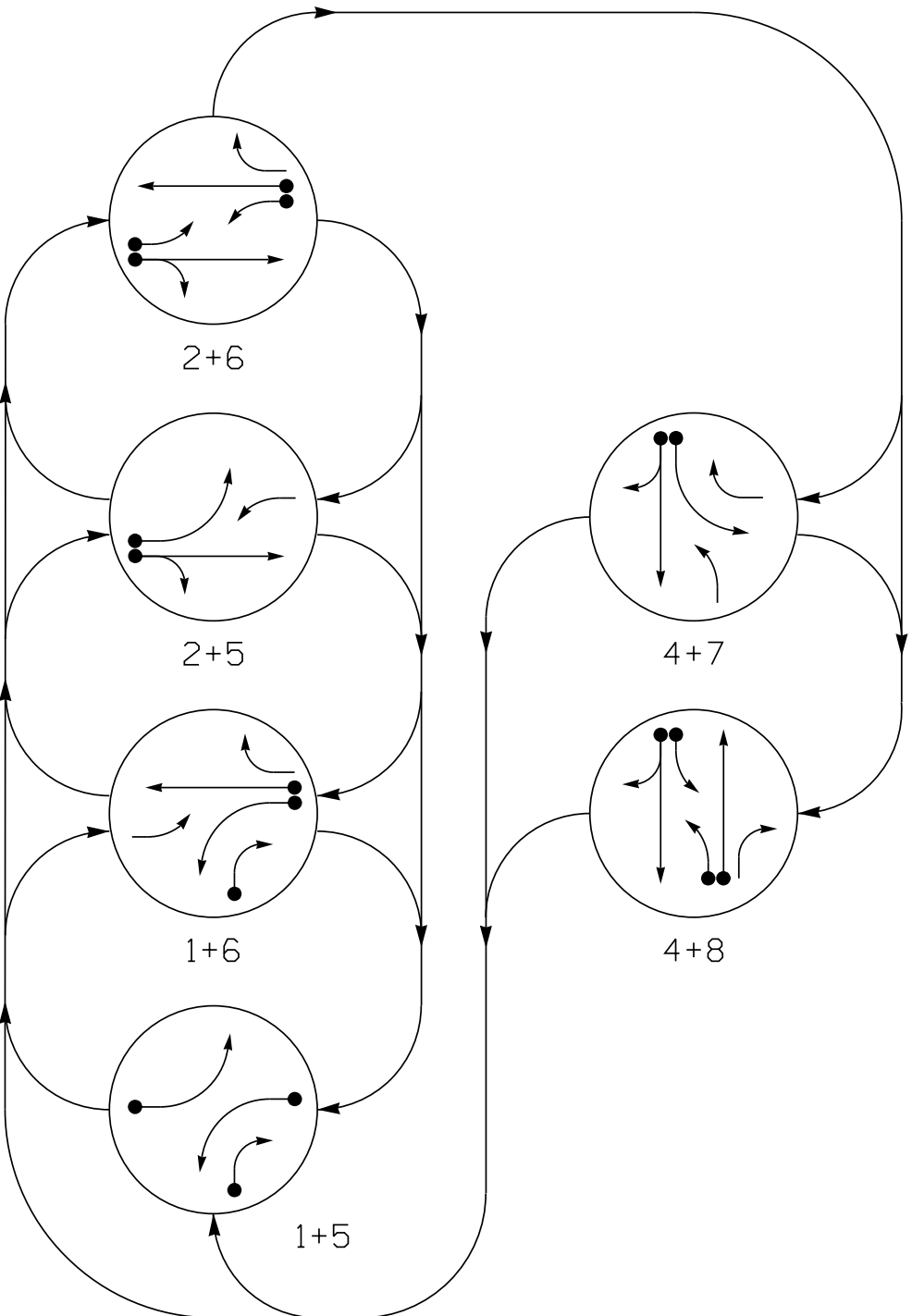
750 N. Greenfield Pkwy, Garner, NC 27529

6 Phase
Fully Actuated
(NC 135 CLS)
Signal System #: D07-09_Mayodan

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Phase 7 may be lagged.
- Reposition existing signalheads numbered 11, 21, 22, 51, 61, and 62.
- Set all detector units to presence mode.
- This intersection uses video detection. Install detectors according to the manufacturer's instruction to achieve the desired detection.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signalsystem timing values supersede these values.

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

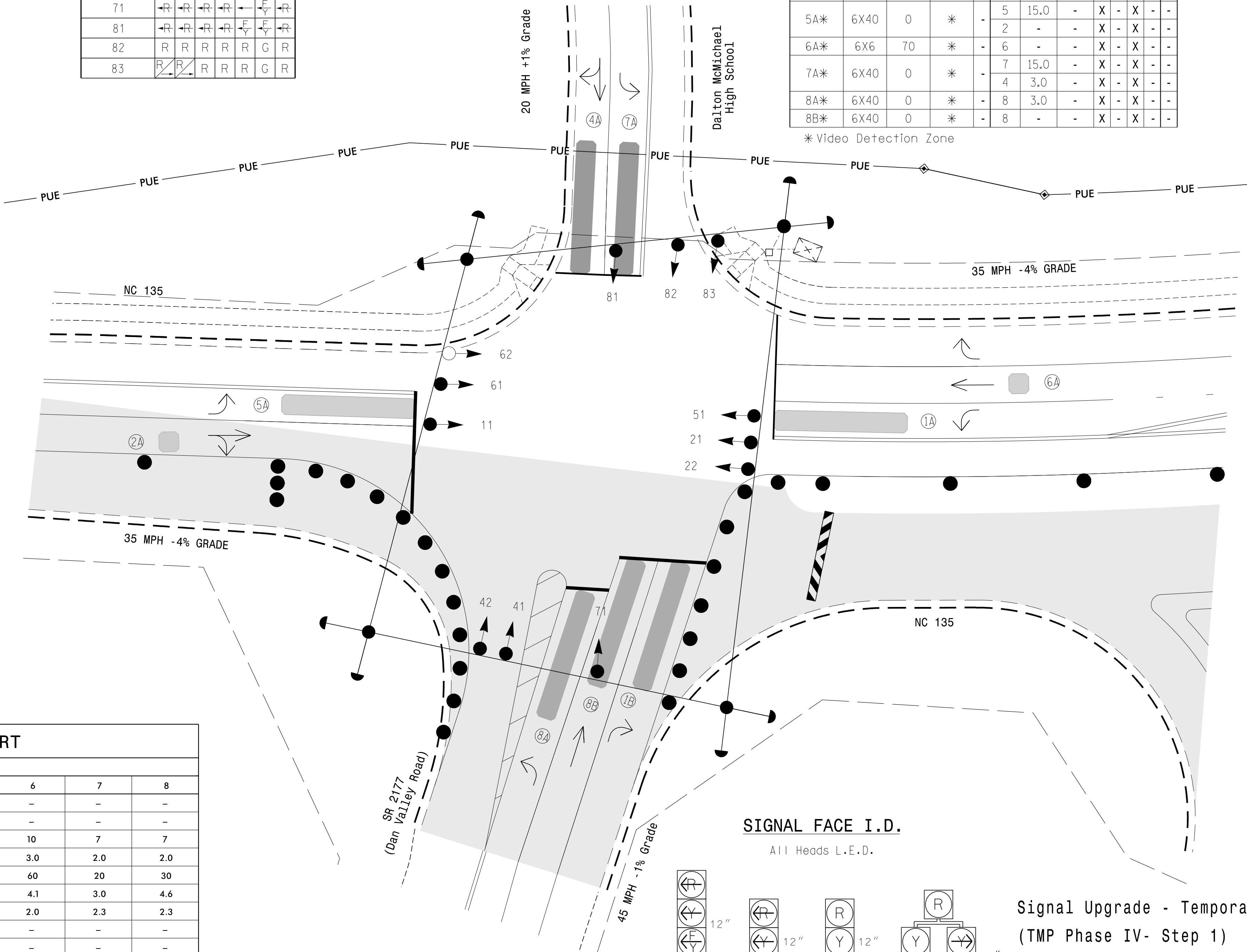
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT

SIGNAL FACE	PHASE						
	1 + 5	1 + 6	2 + 5	2 + 6	4 + 7	4 + 8	FLASH
11	←	←	←	←	←	←	←
21, 22	R	R	G	G	R	R	R
41, 42	R	R	R	R	G	G	R
51	←	←	←	←	←	←	←
61	R	G	R	G	R	R	R
62	R	G	R	G	R	R	R
71	←	←	←	←	←	←	←
81	←	←	←	←	←	←	←
82	R	R	R	R	R	G	R
83	R	R	R	R	R	G	R

MAXTIME DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING						
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A*	6X40	0	*	-	1	15.0	-	X	-	X	-
1B*	6X40	0	*	-	1	15.0	-	X	-	X	-
2A*	6X6	70	*	-	2	-	-	X	-	X	-
4A*	6X40	0	*	-	4	10.0	-	X	-	X	-
5A*	6X40	0	*	-	5	15.0	-	X	-	X	-
6A*	6X6	70	*	-	6	-	-	X	-	X	-
7A*	6X40	0	*	-	7	15.0	-	X	-	X	-
8A*	6X40	0	*	-	8	3.0	-	X	-	X	-
8B*	6X40	0	*	-	8	-	-	X	-	X	-

* Video Detection Zone



MAXTIME TIMING CHART

FEATURE	PHASE							
	1	2	4	5	6	7	8	
Walk *	-	-	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-	-	-
Min Green *	7	10	7	7	10	7	7	7
Passage *	2.0	3.0	2.0	2.0	3.0	2.0	2.0	2.0
Max 1 *	20	60	30	20	60	20	30	30
Yellow Change	3.0	4.1	4.6	3.0	4.1	3.0	4.6	4.6
Red Clear	2.4	2.0	2.3	2.6	2.0	2.3	2.3	2.3
Added Initial *	-	-	-	-	-	-	-	-
Maximum Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Advance Walk	-	-	-	-	-	-	-	-
Non Lock Detector	X	-	X	X	-	X	X	X
Vehicle Recall	-	MIN RECALL	-	-	MIN RECALL	-	-	-
Dual Entry	-	-	X	-	-	-	X	X

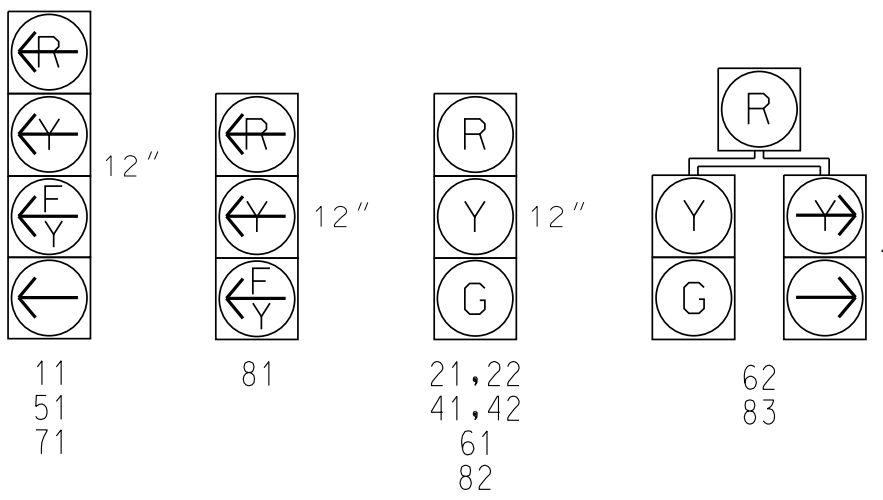
* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

- | PROPOSED | EXISTING |
|--|----------------------------|
| Traffic Signal Head | ● |
| Modified Signal Head | N/A |
| Sign | — |
| Pedestrian Signal Head With Push Button & Sign | ■ |
| Signal Pole with Guy | ● |
| Signal Pole with Sidewalk Guy | ● |
| Inductive Loop Detector | — |
| Controller & Cabinet | — |
| Junction Box | ■ |
| 2-in Underground Conduit | — |
| N/A | Right of Way |
| N/A | Permanent Utility Easement |
| Directional Arrow | → |
| Non-Intrusive Detection Zone | — |
| Construction Zone | — |
| Construction Zone Drums | ● |
| N/A | Curb Ramp |

SIGNAL FACE I.D.

All Heads L.E.D.

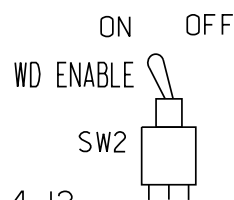


Signal Upgrade - Temporary Design 3
(TMP Phase IV- Step 1)

Prepared for the Offices of: Transportation Mobility and Safety Division UNIVERSITY OF NORTH CAROLINA SIGNAL DESIGN SECTION 750 N. Greenfield Pkwy, Garner, NC 27529	NC135 at SR 2177 (Dan Valley Road) and McMichael High School Division 7 Rockingham County Mayodan PLAN DATE: August 2025 PREPARED BY: Jamal Khdeir REVIEWED BY: Golam Moynuddin	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 034454 GOLAM M. MOYNUDDIN SIGNED BY: Golam Moynuddin 8/1/2025 DATE SIC. INVENTORY NO. 07-1395 13
--	--	--

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 2-5, 2-6, 2-9, 2-11, 4-7, 4-8, 4-10, 4-12, 5-9, 5-11, 6-9, 6-11, 7-10, 7-12, 8-10, 8-12, 9-11 and 10-12.



NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that the Red Enable is active at all times during normal operation.
4. Integrate monitor with Ethernet network in cabinet.

(front view)



FS = FLASH SENSE
ST = STOP TIME

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.

2. Program phases 4 and 8 for Dual Entry.
3. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
4. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
5. The cabinet and controller are part of the System #: D07-09_Mayodan.

Controller.....	2070LX
Cabinet.....	332 w/ Aux
Software.....	Q-Free MAXTIME
Cabinet Mount.....	Base
Output File Positions.....	18 With Aux. Output File
Load Switches Used.....	S1, S2, S5, S7, S8, S10, S11 AUX S1, AUX S2, AUX S4, AUX S5
Phases Used.....	1, 2, 4, 5, 6, 7, 8
Overlap "1".....	*
Overlap "2".....	*
Overlap "3".....	*
Overlap "4".....	*

*See overlap programming detail

Install a video detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

(install resistors as shown below)

Prepared in the Offices of:



Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27606
License No: C-3097

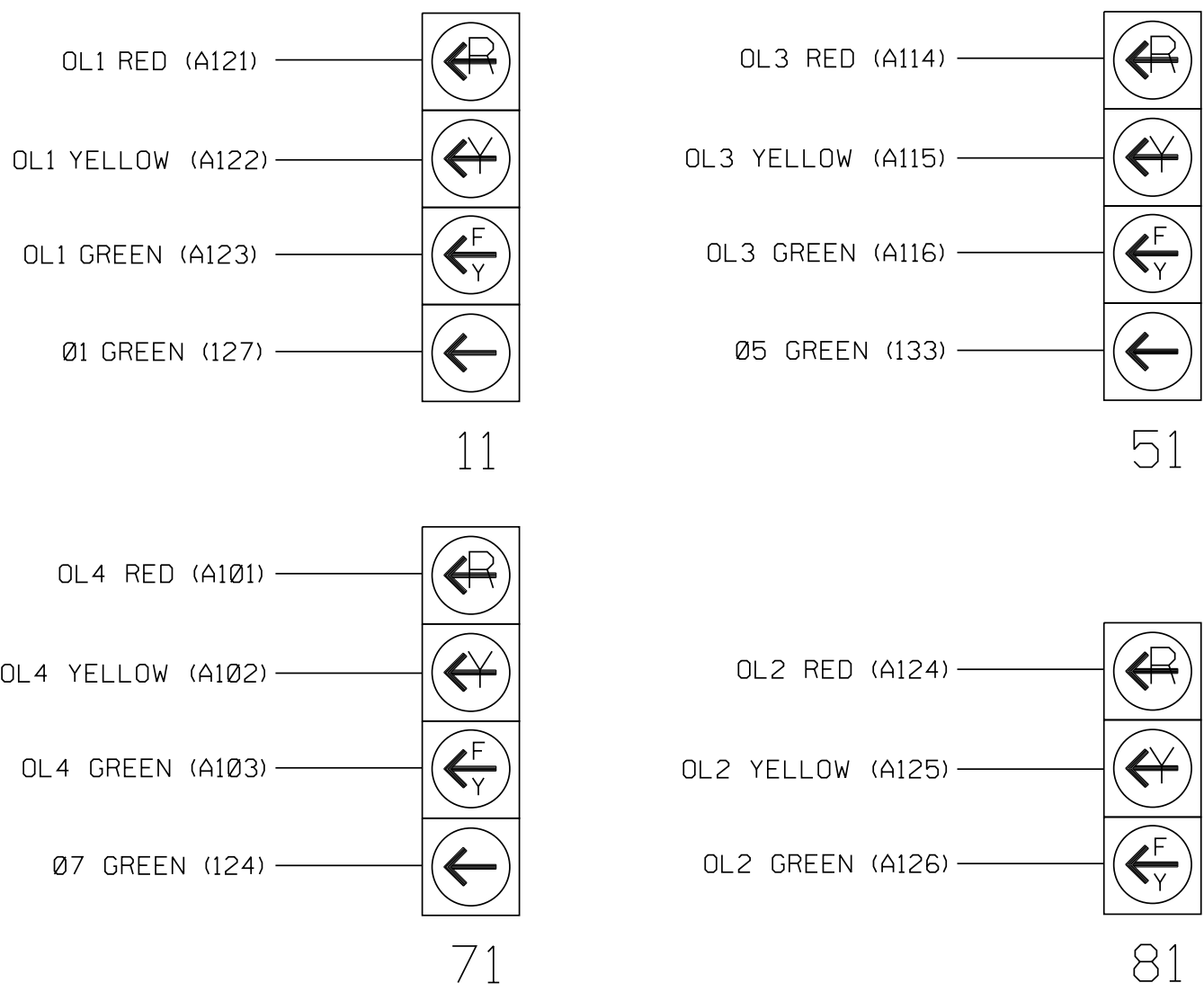
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6		
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18		
PHASE	1	2	² PED	3	4	⁴ PED	5	6	⁶ PED	7	8	⁸ PED	OL1	OL2	SPARE	OL3	OL4	SPARE		
SIGNAL HEAD NO.	11 [★]	83	21,22	NU	NU	41,42	NU	51 [★]	61,62	NU	71 [★]	62	82,83	NU	11 [★]	81 [★]	NU	51 [★]	71 [★]	NU
RED		★	128			101			134			★	107							
YELLOW			129			102		★	135				108							
GREEN			130			103			136				109							
RED ARROW													A121	A124		A114	A101			
YELLOW ARROW		126									123		A122	A125		A115	A102			
FLASHING YELLOW ARROW													A123	A126		A116	A103			
GREEN ARROW	127	127					133			124	124									

NU = Not Used

* Denotes install load resistor. See load resistor installation detail this sheet.

★ See pictorial of head wiring in detail this sheet.

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1395 T3
DESIGNED: August 2025
SEALED: 8/1/2025
REVISED: N/A

Signal Upgrade - Temporary Design 3 (TMP Phase IV - Step 1)
Electrical Detail - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:	NC 135 at SR 2177 (Dan Valley Road) and McMichael High School	SEAL 																													
Prepared for the Offices of:	Division 7 Rockingham County Wayodan																														
	PLAN DATE: <u>August 2025</u> REVIEWED BY: _____	Signed by:  52897CB827ED4EC 8/1/2025 DATE																													
	PREPARED BY: <u>Golam Moineuddin</u> REVIEWED BY: _____																														
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 60%;">REVISONS</th> <th style="width: 20%;">INIT.</th> <th style="width: 20%;">DATE</th> </tr> <tr><td style="height: 20px;"></td><td></td><td></td></tr> <tr><td style="height: 20px;"></td><td></td><td></td></tr> <tr><td style="height: 20px;"></td><td></td><td></td></tr> <tr><td style="height: 20px;"></td><td></td><td></td></tr> <tr><td style="height: 20px;"></td><td></td><td></td></tr> <tr><td style="height: 20px;"></td><td></td><td></td></tr> <tr><td style="height: 20px;"></td><td></td><td></td></tr> <tr><td style="height: 20px;"></td><td></td><td></td></tr> <tr><td style="height: 20px;"></td><td></td><td></td></tr> </table>		REVISONS	INIT.	DATE																										
REVISONS	INIT.	DATE																													
750 N.Greenfield Pkwy,Garner,NC 27529	SIC. INVENTORY NO. 07-1395 T3																														

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap	1	2	3	4
Type	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section
Included Phases	2	4	6	8
Modifier Phases	1	-	5	7
Modifier Overlaps	-	-	-	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

IN ORDER TO INSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

1. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
2. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
3. REMOVE FLASHER UNIT 2.

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

Front Panel
Main Menu >Controller >Unit

Web Interface
Home > Controller > Unit

Modify parameters as shown below and save changes.

StartUp Clearance Hold
6

All Red Flash Exit Time
6

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1395 T3
DESIGNED: August 2025
SEALED: 8/1/2025
REVISED: N/A

Signal Upgrade - Temporary Design 3 (TMP Phase IV - Step 1)
Electrical Detail - Sheet 2 of 2

**DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED**

Prepared in the Offices of:



Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27606
License No: C-3097

**ELECTRICAL AND PROGRAMMING
DETAILS FOR:**

[illegible]

SEAL



Seal of the Professional Engineer
North Carolina
Professional Engineer
SEAL
034454
GOLAM M. MOYNUDDIN

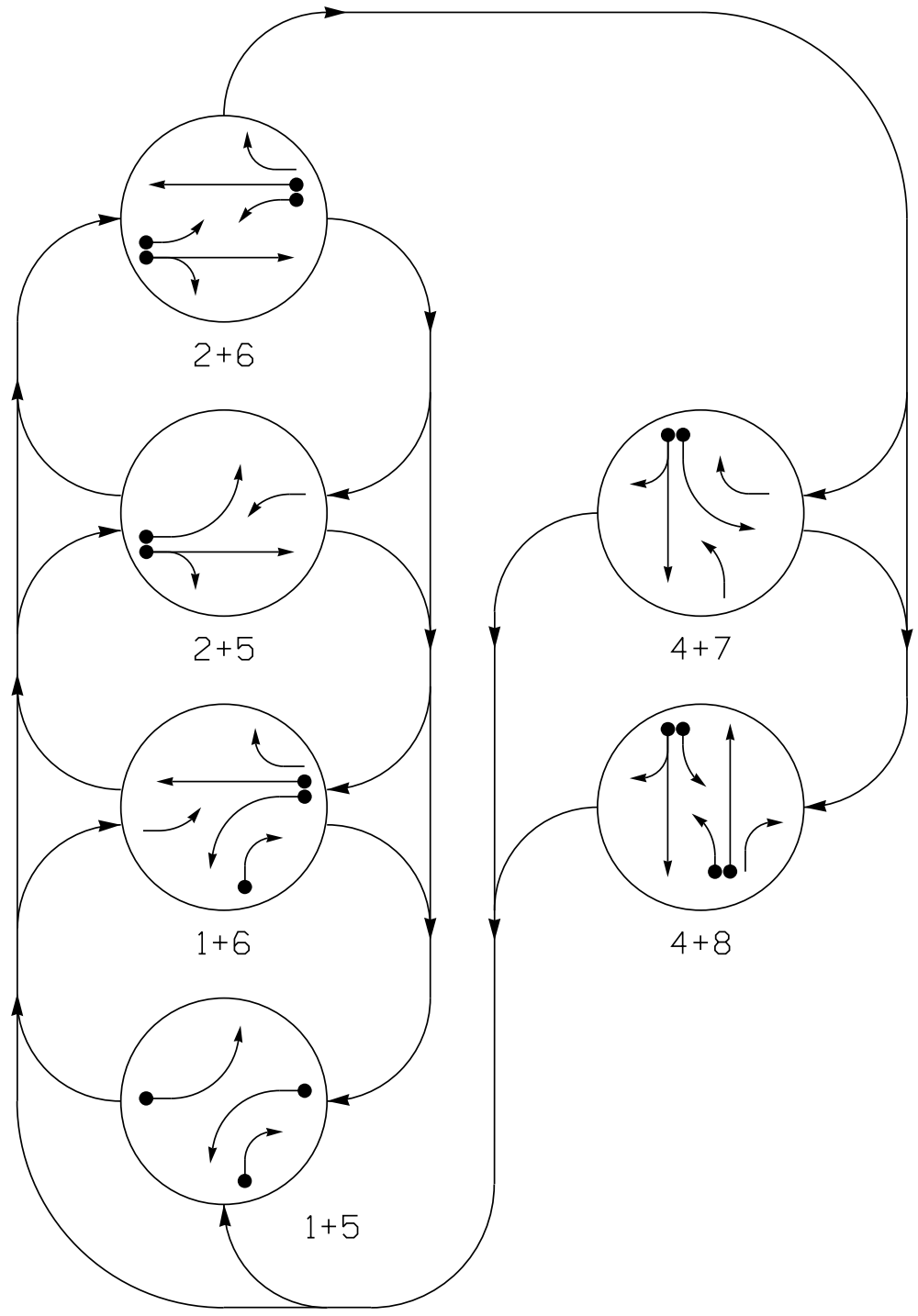
Signed by: _____
Golam Moynuddin

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8/1/2025
DATE

SIG. INVENTORY NO. 07-1395 T3

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE						
	1 + 5	1 + 6	2 + 5	2 + 6	4 + 7	4 + 8	F L A S H
11	←	←	←	←	←	←	
21,22	R	R	G	G	R	R	R
41,42	R	R	R	R	G	G	R
51	←	←	←	←	←	←	
61	R	G	R	G	R	R	R
62	R	G	R	G	R	R	R
71	←	←	←	←	←	←	
81	←	←	←	←	←	←	
82	R	R	R	R	G	G	R
83	R	R	R	R	G	G	R

MAXTIME DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING						
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	NEW CARD
1A*	6X40	0	*	-	1 6	15.0	-	X	-	X	-
1B*	6X40	0	*	-	1 6	15.0	-	X	-	X	-
2A*	6X6	70	*	*	2	-	-	X	-	X	-
4A*	6X40	0	*	-	4	10.0	-	X	-	X	-
5A*	6X40	0	*	*	5	15.0	-	X	-	X	-
6A*	6X6	70	*	-	6	-	-	X	-	X	-
7A*	6X40	0	*	-	7	15.0	-	X	-	X	-
8A*	6X40	0	*	-	8	3.0	-	X	-	X	-
8B*	6X40	0	*	-	8	-	-	X	-	X	-

* Video Detection Zone

6 Phase
Fully Actuated
(NC 135 CLS)
Signal System #: D07-09_Mayodan

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Phase 7 may be lagged.
- Reposition all existing signalheads numbered 21, 22, and 51.
- Set all detector units to presence mode.
- This intersection uses video detection. Install detectors according to the manufacturer's instruction to achieve the desired detection.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

- | PROPOSED | EXISTING |
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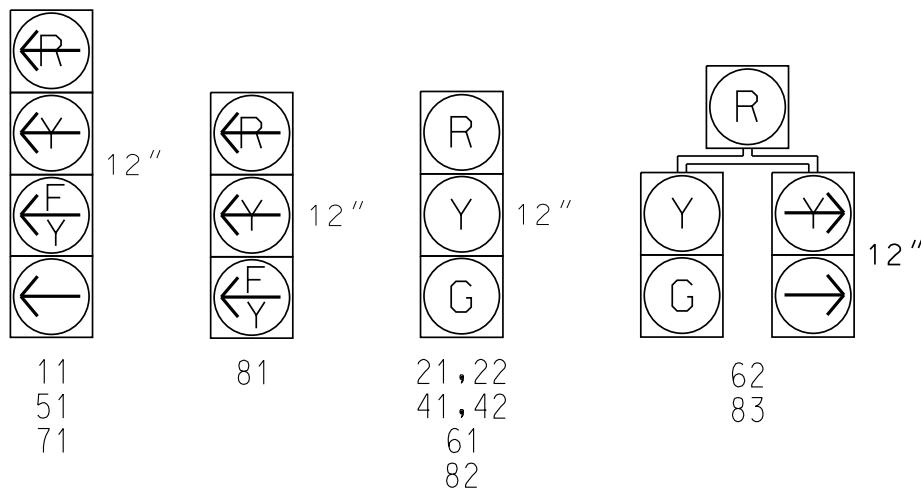
MAXTIME TIMING CHART

FEATURE	PHASE							
	1	2	4	5	6	7	8	
Walk *	-	-	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-	-	-
Min Green *	7	10	7	7	10	7	7	7
Passage *	2.0	3.0	2.0	2.0	3.0	2.0	2.0	2.0
Max 1 *	20	60	30	20	60	20	30	30
Yellow Change	3.0	4.1	4.6	3.0	4.1	3.0	4.6	4.6
Red Clear	2.9	1.8	2.9	2.8	1.8	2.9	2.9	2.9
Added Initial *	-	-	-	-	-	-	-	-
Maximum Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Advance Walk	-	-	-	-	-	-	-	-
Non Lock Detector	X	-	X	X	-	X	X	X
Vehicle Recall	-	MIN RECALL	-	-	MIN RECALL	-	-	-
Dual Entry	-	-	X	-	-	-	X	X

* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

SIGNAL FACE I.D.

All Heads L.E.D.



Signal Upgrade - Temporary Design 4
(TMP Phase IV- Step 2)

Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

NC135
at
SR 2177 (Dan Valley Road) and
McMichael High School
Division 7 Rockingham County Mayodan

PLAN DATE: August 2025 REVIEWED BY: Golam Moynuddin

PREPARED BY: Jamal Khdeir REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

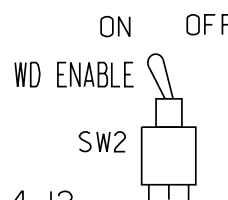
SEAL

Signed by: Golam Moynuddin
8/1/2025
DATE

SIC. INVENTORY NO. 07-1395 T4

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 2-5, 2-6, 2-9, 2-11, 4-7, 4-8, 4-10, 4-12, 5-9, 5-11, 6-9, 6-11, 7-10, 7-12, 8-10, 8-12, 9-11 and 10-12.



ON →

RF 2010	OPTIONS
RP DISABLE	
WD 1.0 SEC	
GY ENABLE	
SF#1 POLARITY	
LEDguard	
RF SSM	
FYA COMPACT	FYA
FYA 1-9	
FYA 3-10	
FYA 5-11	
FYA 7-12	

■ = DENOTES POSITION
OF SWITCH

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.

2. Program phases 4 and 8 for Dual Entry.

3. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.

4. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.

5. The cabinet and controller are part of the Signal System #: D07-09_Mayodan.

Controller.....	2070LX
Cabinet.....	332 w/ Aux
Software.....	Q-Free MAXTIME
Cabinet Mount.....	Base
Output File Positions.....	18 With Aux. Output File
Load Switches Used.....	S1, S2, S5, S7, S8, S10, S11 AUX S1, AUX S2, AUX S4, AUX S5

Phases Used.....1, 2, 4, 5, 6, 7, 8
 Overlap "1".....*
 Overlap "2".....*
 Overlap "3".....*
 Overlap "4".....*

*See overlap programming detail

(front view)



FS = FLASH SENSE
ST = STOP TIME

Install a video detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

(install resistors as shown below)

Prepared in the Offices of:



Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27606
License No: C-3097

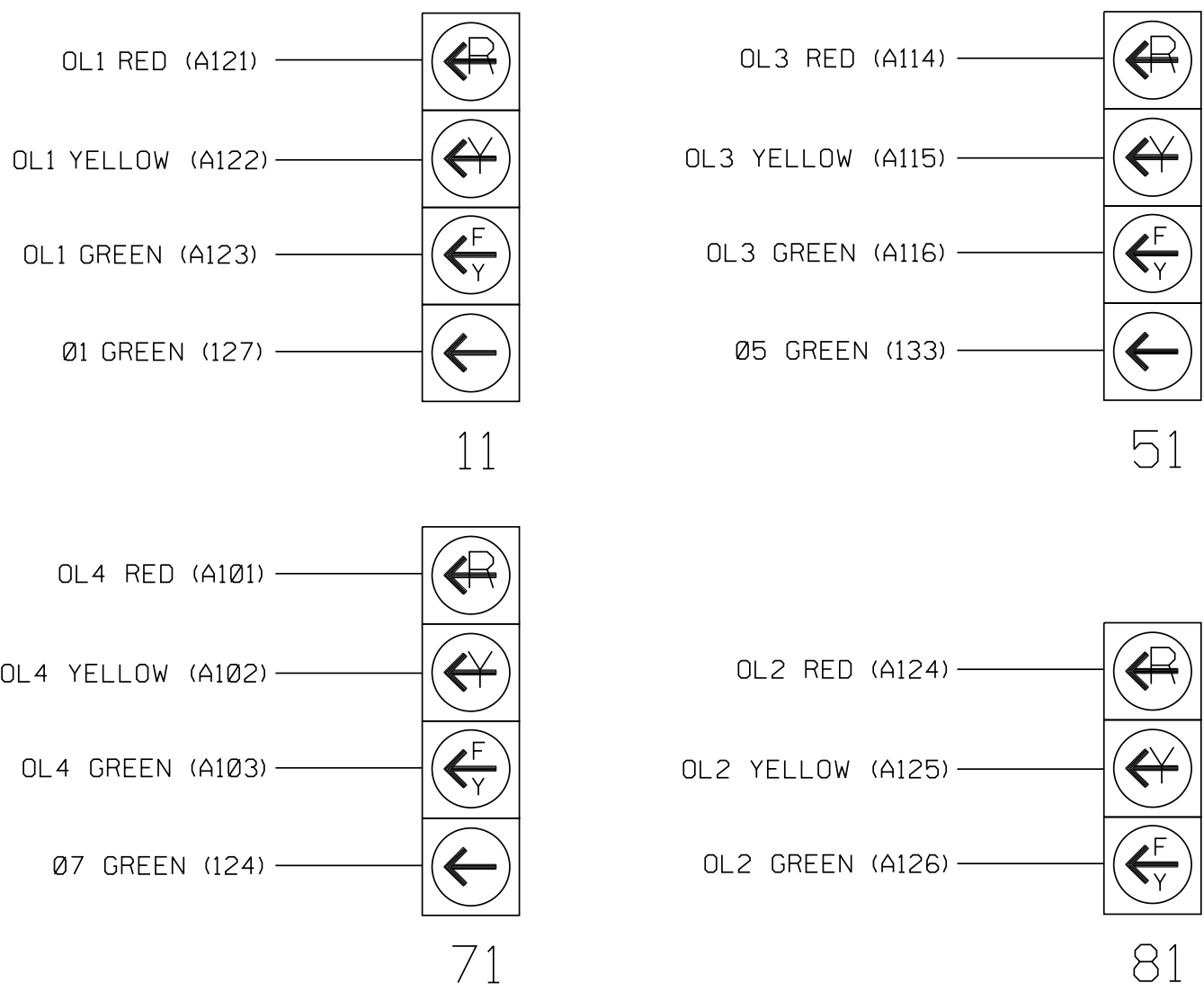
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6		
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18		
PHASE	1	2	² PED	3	4	⁴ PED	5	6	⁶ PED	7	8	⁸ PED	OL1	OL2	SPARE	OL3	OL4	SPARE		
SIGNAL HEAD NO.	11 [★]	83	21,22	NU	NU	41,42	NU	51 [★]	61,62	NU	71 [★]	62	82,83	NU	11 [★]	81 [★]	NU	51 [★]	71 [★]	NU
RED		★	128			101			134			★	107							
YELLOW			129			102		★	135				108							
GREEN			130			103			136				109							
RED ARROW													A121	A124		A114	A101			
YELLOW ARROW		126									123			A122	A125		A115	A102		
FLASHING YELLOW ARROW														A123	A126		A116	A103		
GREEN ARROW	127	127					133			124	124									

NU = Not Used

* Denotes install load resistor. See load resistor installation detail this sheet.

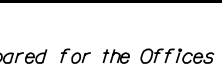
★ See pictorial of head wiring in detail this sheet.

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1395 T4
DESIGNED: August 2025
SEALED: 8/1/2025
REVISED: N/A

Signal Upgrade - Temporary Design 4 (TMP Phase IV - Step 2)
Electrical Detail - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:	NC 135 at SR 2177 (Dan Valley Road) and McMichael High School																																		
Prepared for the Offices of: 	Division 7 Rockingham County Mayodan																																		
	PLAN DATE: <u>August 2025</u>	REVIEWED BY: _____																																	
	PREPARED BY: <u>Golam Moinuddin</u>	REVIEWED BY: _____																																	
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">REVISIONS</th> <th style="width: 20%;">INIT.</th> <th style="width: 20%;">DATE</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	REVISIONS	INIT.	DATE																															Signed by: <u>Golam Moinuddin</u> 8/1/2025 DATE
REVISIONS	INIT.	DATE																																	
750 N.Greenfield Pkwy.Gorner,NC 27529	SIG. INVENTORY NO. 07-1395 T4																																		

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2	3	4
Type	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section
Included Phases	2	4	6	8
Modifier Phases	1	-	5	7
Modifier Overlaps	-	-	-	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

Front Panel
Main Menu >Controller >Unit

Web Interface
Home > Controller > Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

OUTPUT CHANNEL CONFIGURATION

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

FLASHER CIRCUIT MODIFICATION DETAIL

IN ORDER TO INSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

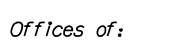
1. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
2. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
3. REMOVE FLASHER UNIT 2.

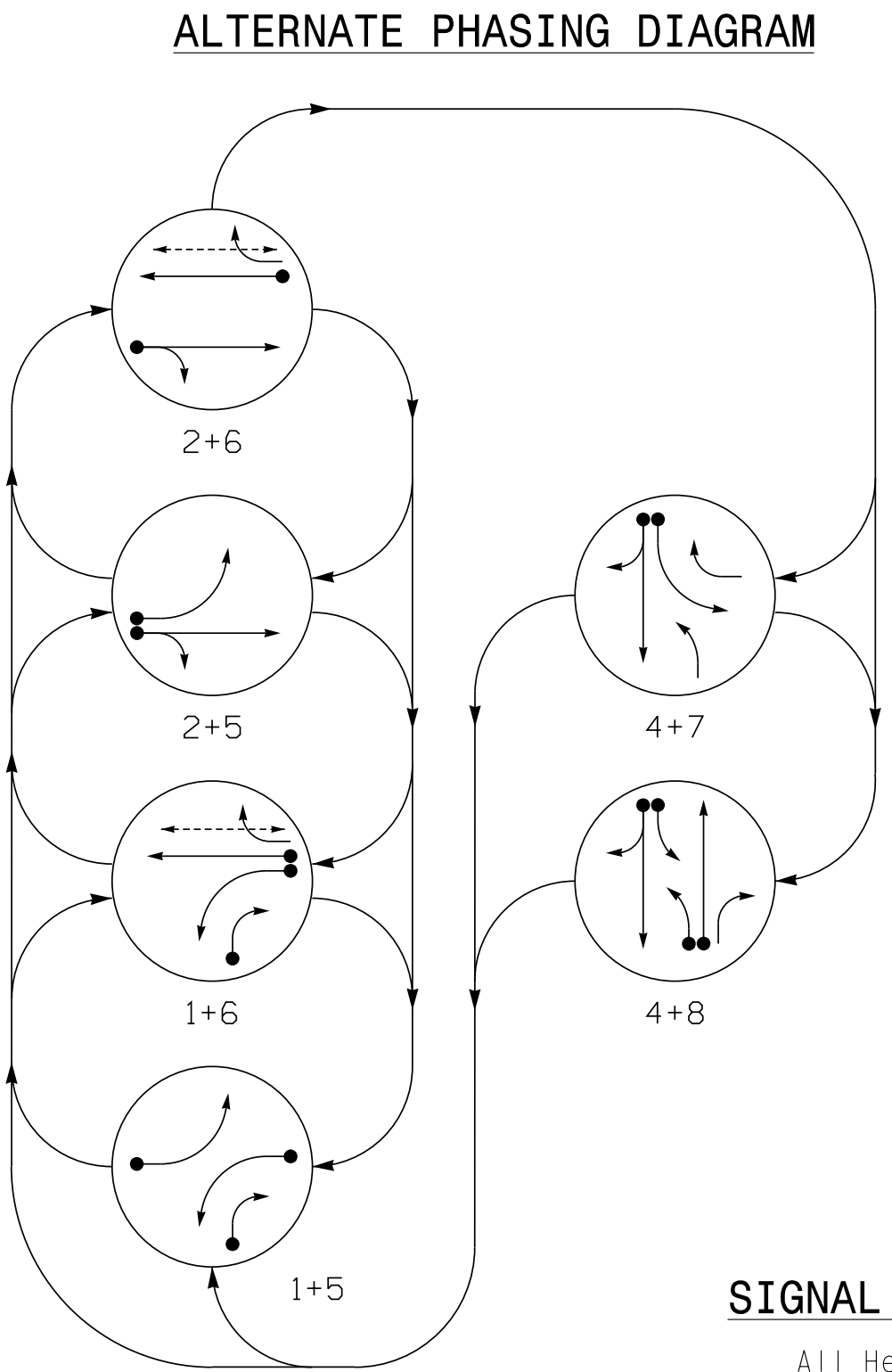
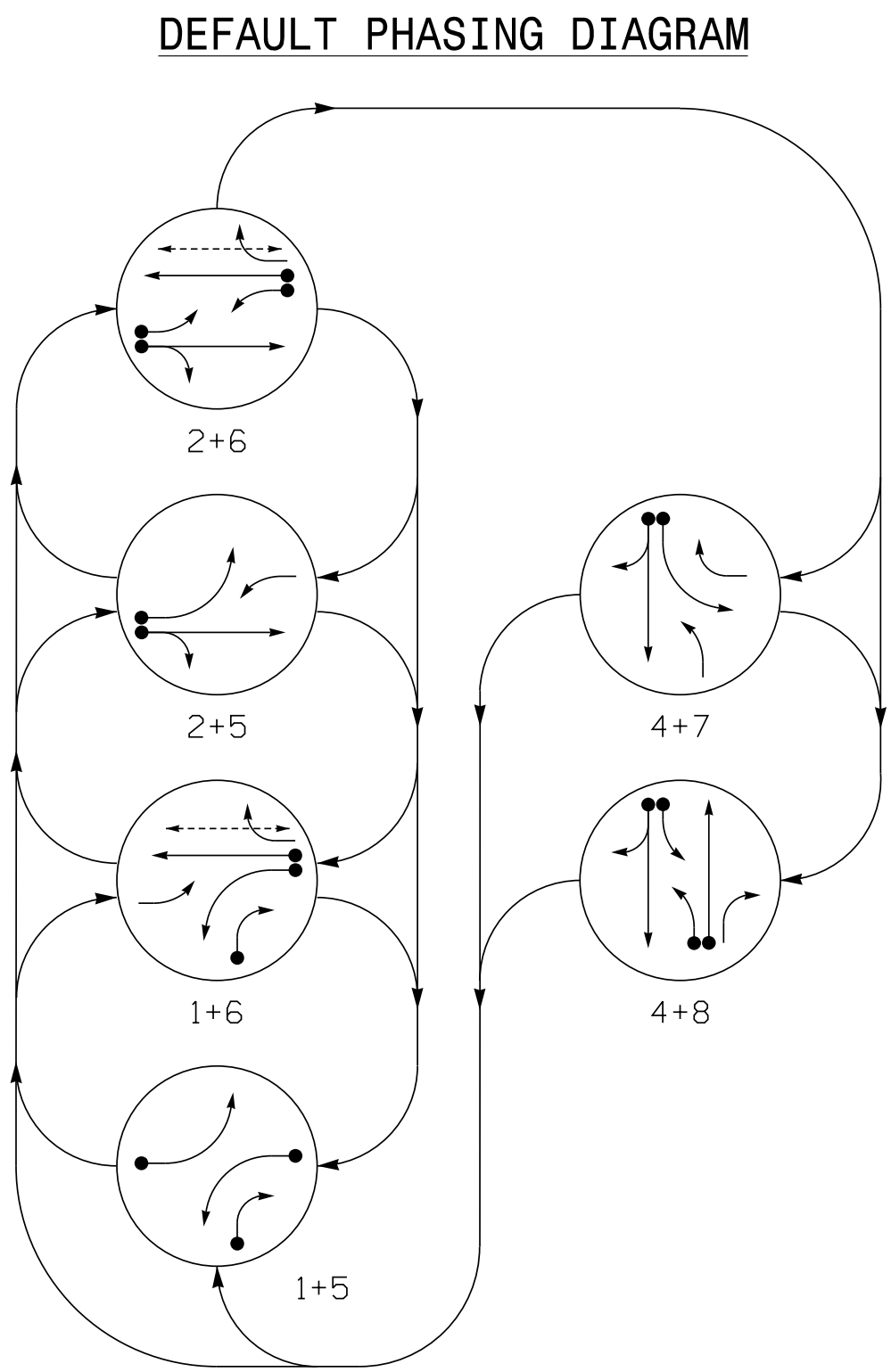
THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1395 T4
DESIGNED: August 2025
SEALED: 8/1/2025
REVISED: N/A

Signal Upgrade - Temporary Design 4 (TMP Phase IV - Step2)
Electrical Detail - Sheet 2 of 2

**DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED**

ELECTRICAL AND PROGRAMMING DETAILS FOR:	NC 135 at SR 2177 (Dan Valley Road) and McMichael High School	SEAL 																																	
Prepared for the Offices of: 	Division 7 Rockingham County Waydan																																		
	PLAN DATE: August 2025 REVIEWED BY:																																		
	PREPARED BY: Golam Moinuddin REVIEWED BY:																																		
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">REVISONS</th> <th style="width: 20%;">INIT.</th> <th style="width: 20%;">DATE</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	REVISONS	INIT.	DATE																															
REVISONS	INIT.	DATE																																	
750 N.Greenfield Pkwy,Garner,NC 27529		Signed by  92897CB8272E4E6C 8/1/2025 DATE																																	
		SIG. INVENTORY NO.07-1395 T4																																	



DEFAULT PHASING TABLE OF OPERATION							
SIGNAL FACE	PHASE						
	1 + 5	1 + 6	2 + 5	2 + 6	4 + 7	4 + 8	FLASH
11	←	←	← _F	← _F	← _R	← _R	← _R
21,22	R	R	G	G	R	R	R
41,42	R	R	R	R	G	G	R
51	←	← _F	←	← _F	← _R	← _R	← _R
61	R	G	R	G	R	R	R
62	R	G	R	G		R	R
71	← _R	← _R	← _R	← _R	←	← _F	← _R
81	← _R	← _R	← _R	← _R	← _F	← _F	← _R
82	R	R	R	R	R	G	R
83			R	R	R	G	R
P61,P62	DW	W	DW	W	DW	DW	DRK

ALTERNATE PHASING TABLE OF OPERATION							
SIGNAL FACE	PHASE						
	1 + 5	1 + 6	2 + 5	2 + 6	4 + 7	4 + 8	FLASH
11	←	←	←	←	←	←	←
21,22	R	R	G	G	R	R	R
41,42	R	R	R	R	G	G	R
51	←	←	←	←	←	←	←
61	R	G	R	G	R	R	R
62	R	G	R	G	R	R	R
71	←	←	←	←	←	←	←
81	←	←	←	←	←	←	←
82	R	R	R	R	R	G	R
83	R	R	R	R	R	G	R
P61,P62	DW	W	DW	W	DW	DW	DRK

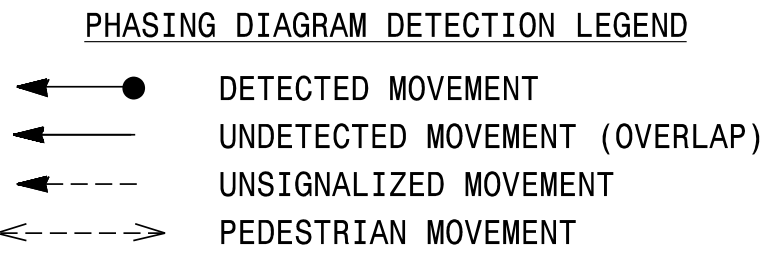
MAXTIME DETECTOR INSTALLATION CHART										
DETECTOR					PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL CALL	DELAY DURING GREEN NEW CARD
1A	6X40	0	2-4-2	-	1 6*	15.0*	-	X	-	X
1B	6X40	0	2-4-2	-	1	15.0	-	X	-	X
2A	6X6	250	6	-	2	-	-	X	X	X
4A	6X35	+3.5	2-4-2	-	4	10.0	-	X	-	X
5A	6X40	0	2-4-2	-	5 2*	15.0*	-	X	-	X
6A	6X6	250	4	-	6	-	-	X	X	X
7A	6X35	+3.5	2-4-2	-	7	15.0	-	X	-	X
8A	6X40	0	2-4-2	-	8	3.0	-	X	-	X
8B	6X40	0	2-4-2	-	8	-	-	X	-	X

* Disable delay during alternate phasing operation.
** Reduce delay to 3 seconds during alternate phasing operation.
Disable phase call for loop during alternate phasing operation.

6 Phase
Fully Actuated
(NC 135 CLS)
Signal System #: D07-09_Mayodan

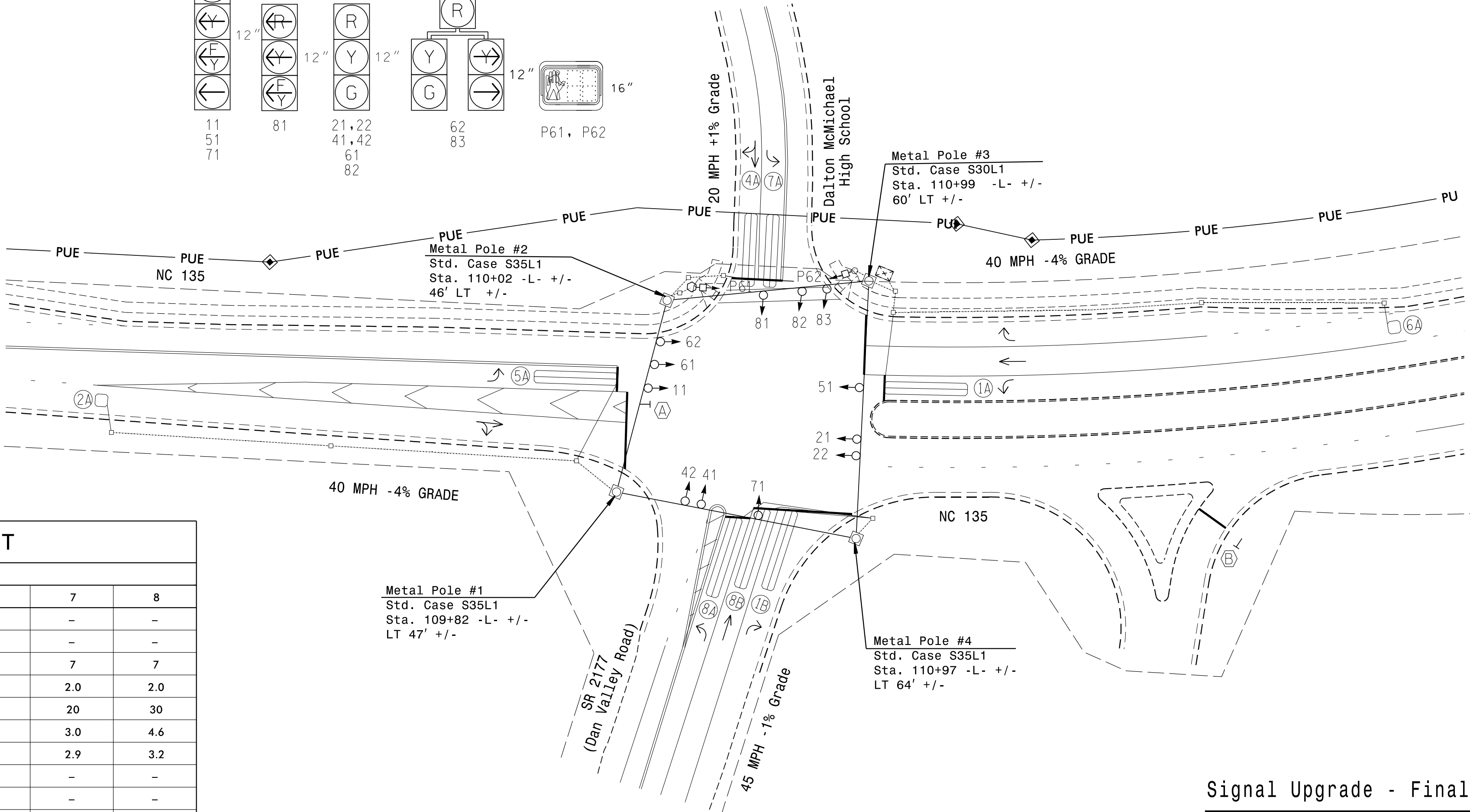
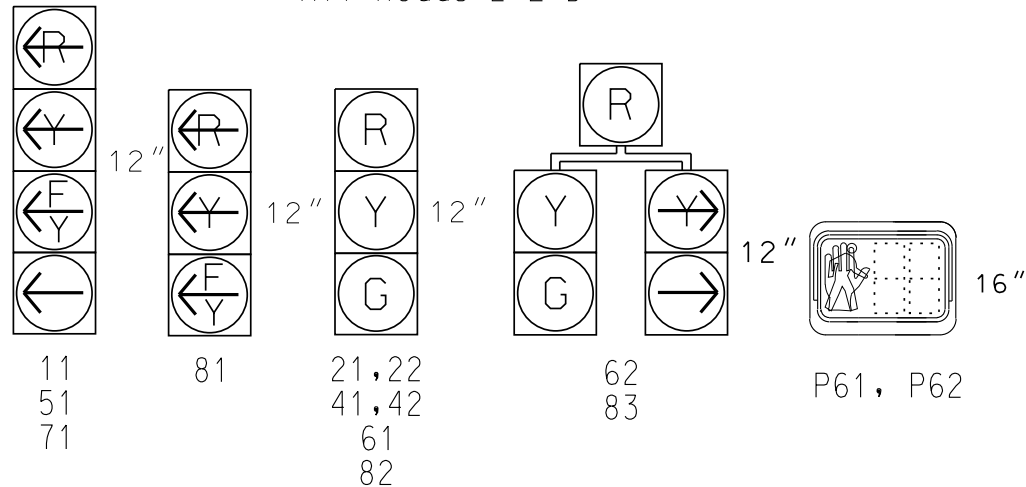
NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Phase 7 may be lagged.
- Set all detector units to presence mode.
- Omit "Walk" and flashing "Don't Walk" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- The Division Traffic Engineer will determine the hours of use for each phasing plan.



SIGNAL FACE I.D.

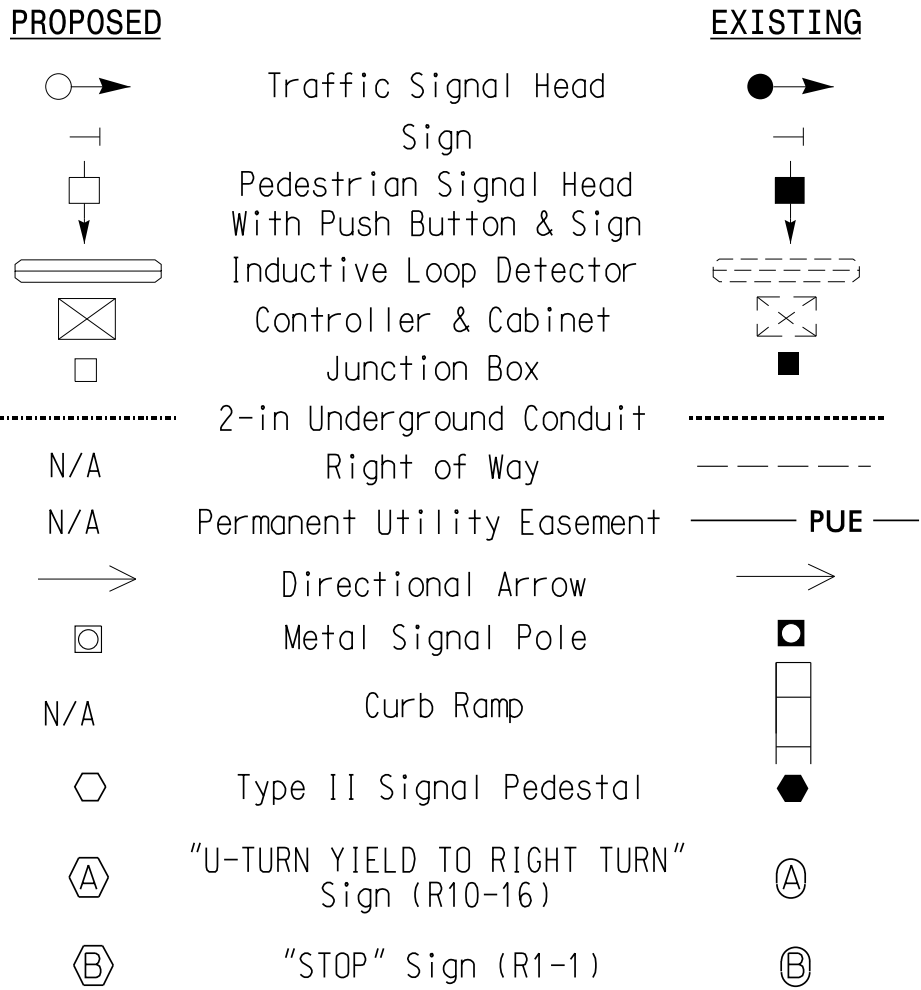
All Heads L.E.D.



MAXTIME TIMING CHART							
FEATURE	PHASE						
	1	2	4	5	6	7	8
Walk *	-	-	-	-	12	-	-
Ped Clear	-	-	-	-	13	-	-
Min Green *	7	12	7	7	12	7	7
Passage *	2.0	6.0	2.0	2.0	6.0	2.0	2.0
Max 1 *	20	60	30	20	60	20	30
Yellow Change	3.0	4.5	4.6	3.0	4.5	3.0	4.6
Red Clear	3.2	1.8	3.2	3.2	1.8	2.9	3.2
Added Initial *	-	2.5	-	-	2.5	-	-
Maximum Initial *	-	29	-	-	29	-	-
Time Before Reduction *	-	15	-	-	15	-	-
Time To Reduce *	-	30	-	-	30	-	-
Minimum Gap	-	3.0	-	-	3.0	-	-
Advance Walk	-	-	-	-	5	-	-
Non Lock Detector	X	-	X	X	-	X	X
Vehicle Recall	-	MIN RECALL	-	-	MIN RECALL	-	-
Dual Entry	-	-	X	-	-	-	X

* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown.
Min Green for all other phases should not be lower than 4 seconds.

LEGEND



Signal Upgrade - Final Design

Prepared for the Offices of:
Transportation Mobility and Safety Division
UNIVERSITY OF NORTH CAROLINA
SCHOOL OF TRANSPORTATION
Signal Design Section
750 N. Greenfield Pkwy, Garner, NC 27529

NC 135
at
SR 2177 (Dan Valley Road) and
McMichael High School
Division 7 Rockingham County Mayodan
PLAN DATE: August 2025
REVIEWED BY: Jamal Khdeir
PREPARED BY: Golam Moinuddin
REVIEWED BY: Golam Moinuddin

0 SCALE
1' = 40'

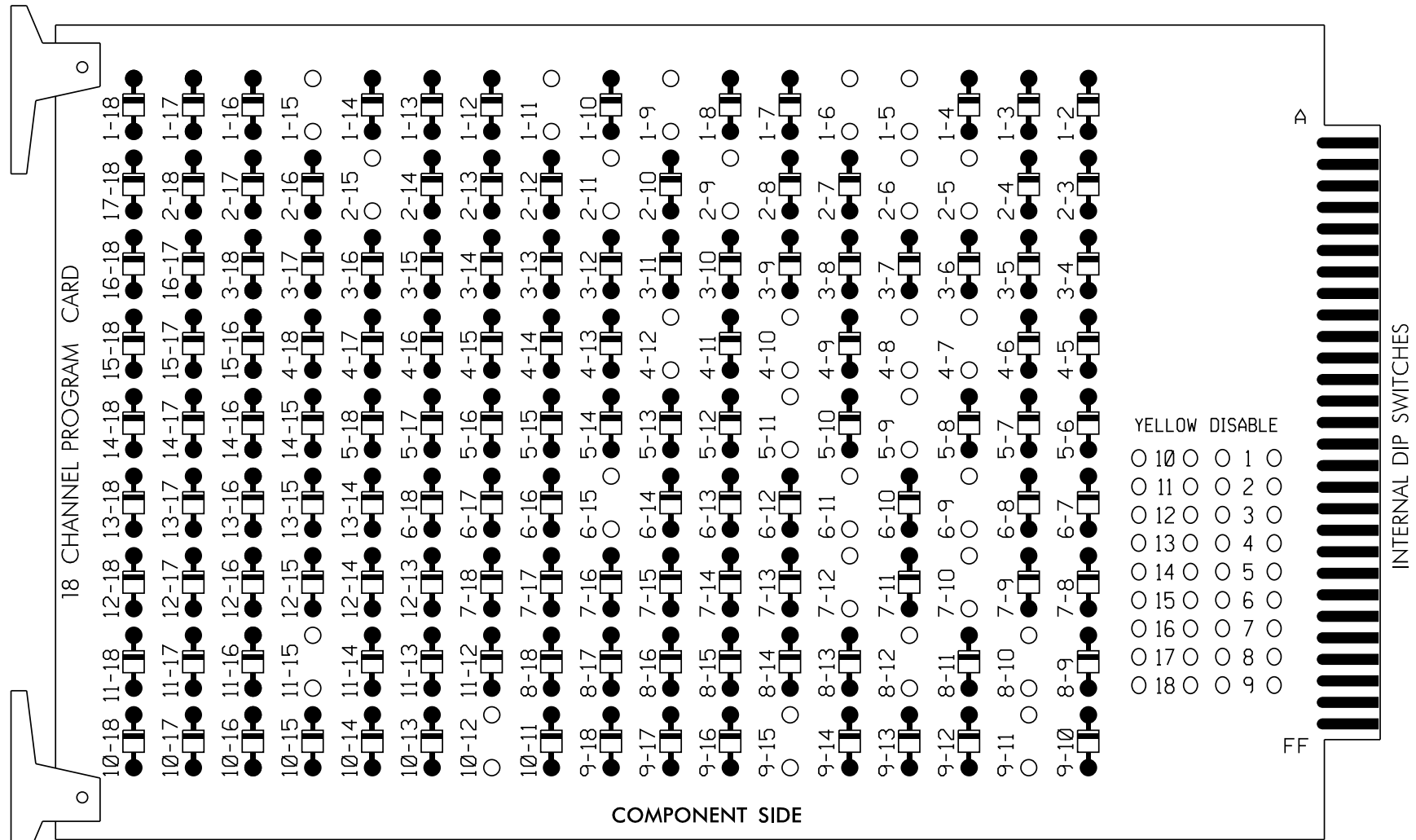
DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

SEAL
GOLAM MOINUDDIN
PROFESSIONAL ENGINEER
034454
8/1/2025
SIGNATURE
DATE
SIG. INVENTORY NO. 07-1395

18 CHANNEL IP CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

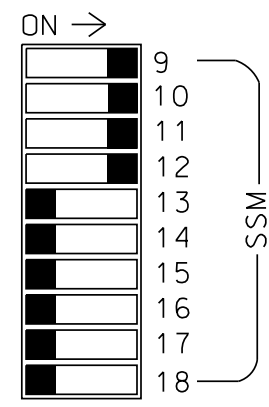
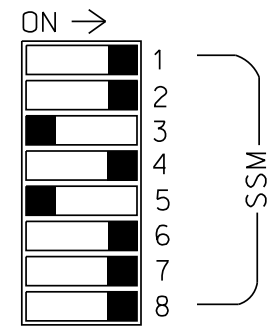
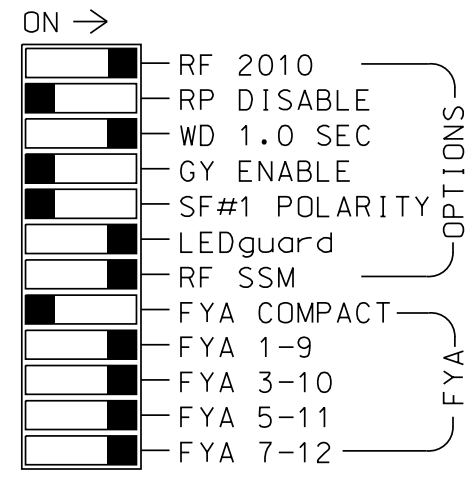
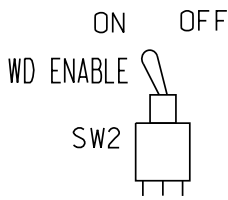
REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 1-15, 2-5, 2-6, 2-9, 2-11, 2-15, 4-7, 4-8, 4-10, 4-12, 5-9, 5-11, 6-9, 6-11, 6-15, 7-10, 7-12, 8-10, 8-12, 9-11, 9-15, 10-12 and 11-15.



REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that the Red Enable is active at all times during normal operation.
- Integrate monitor with Ethernet network in cabinet.



■ = DENOTES POSITION OF SWITCH

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
- Program phases 4 and 8 for Dual Entry.
- Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- The cabinet and controller are part of the Signal System #: D07-09_Mayodan

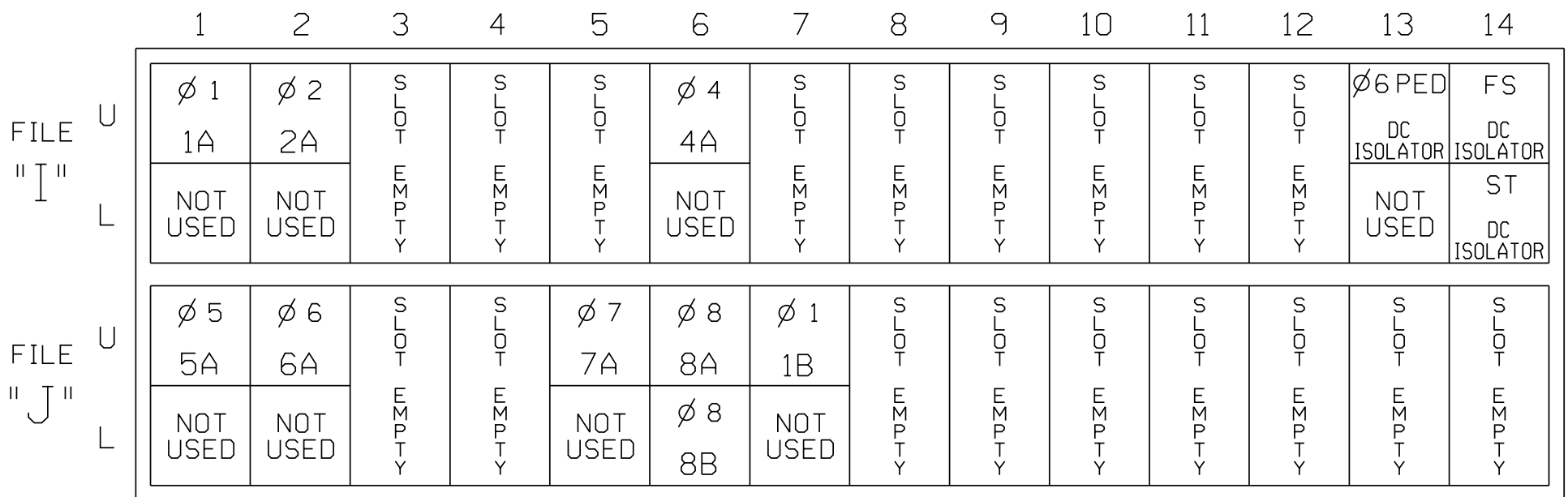
EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S1, S2, S5, S7, S8, S9, S10, S11, AUX S1, AUX S2, AUX S4, AUX S5
Phases Used.....1, 2, 4, 5, 6, 6PED, 7, 8
Overlap "1".....*
Overlap "2".....*
Overlap "3".....*
Overlap "4".....*

*See overlap programming detail on sheet 2

INPUT FILE POSITION LAYOUT

(front view)



EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

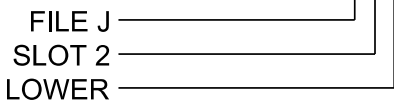
INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	TB2-1,2	I1U	56	18	1 *	1	15.0		X		X	
1B	TB7-1,2	J7U	66	32	24 *	6	3.0		X		X	X
2A	TB2-5,6	I2U	39	1	2	2	-		X	X	X	
4A	TB4-9,10	I6U	41	3	8	4	10.0		X		X	
5A	TB3-1,2	J1U	55	17	15 *	5	15.0		X		X	
6A	TB3-5,6	J2U	40	2	16	6	-		X	X	X	X
7A	TB5-5,6	J5U	57	19	21	7	15.0		X		X	
8A	TB5-9,10	J6U	42	4	22	8	3.0		X		X	
8B	TB5-11,12	J6L	46	8	23	8	-		X		X	
PED PUSH BUTTONS P61,P62	TB8-7,9	I13U	68	34	6	PED 6						

*System detector only. Remove any assigned vehicle phase.

*For the detectors to work as shown on the signal plan see the Detector Programming Detail for Alternate Phasing on Sheet 2 on this plan.

INPUT FILE POSITION LEGEND: J2L



COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

Prepared in the Offices of:



Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27606
License No: C-3097

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	11	83	21,22	NU	NU	41,42	NU	51	61,62	71	62	82,83	NU	11	81	NU	51	71
RED	*	128			101			134		*	107							
YELLOW		129			102		*	135			108							
GREEN		130			103			136			109							
RED ARROW													A121	A124		A114	A101	
YELLOW ARROW	126									123			A122	A125		A115	A102	
FLASHING YELLOW ARROW													A123	A126		A116	A103	
GREEN ARROW	127	127					133			124	124							
Hand icon									119									
Walking person icon									121									

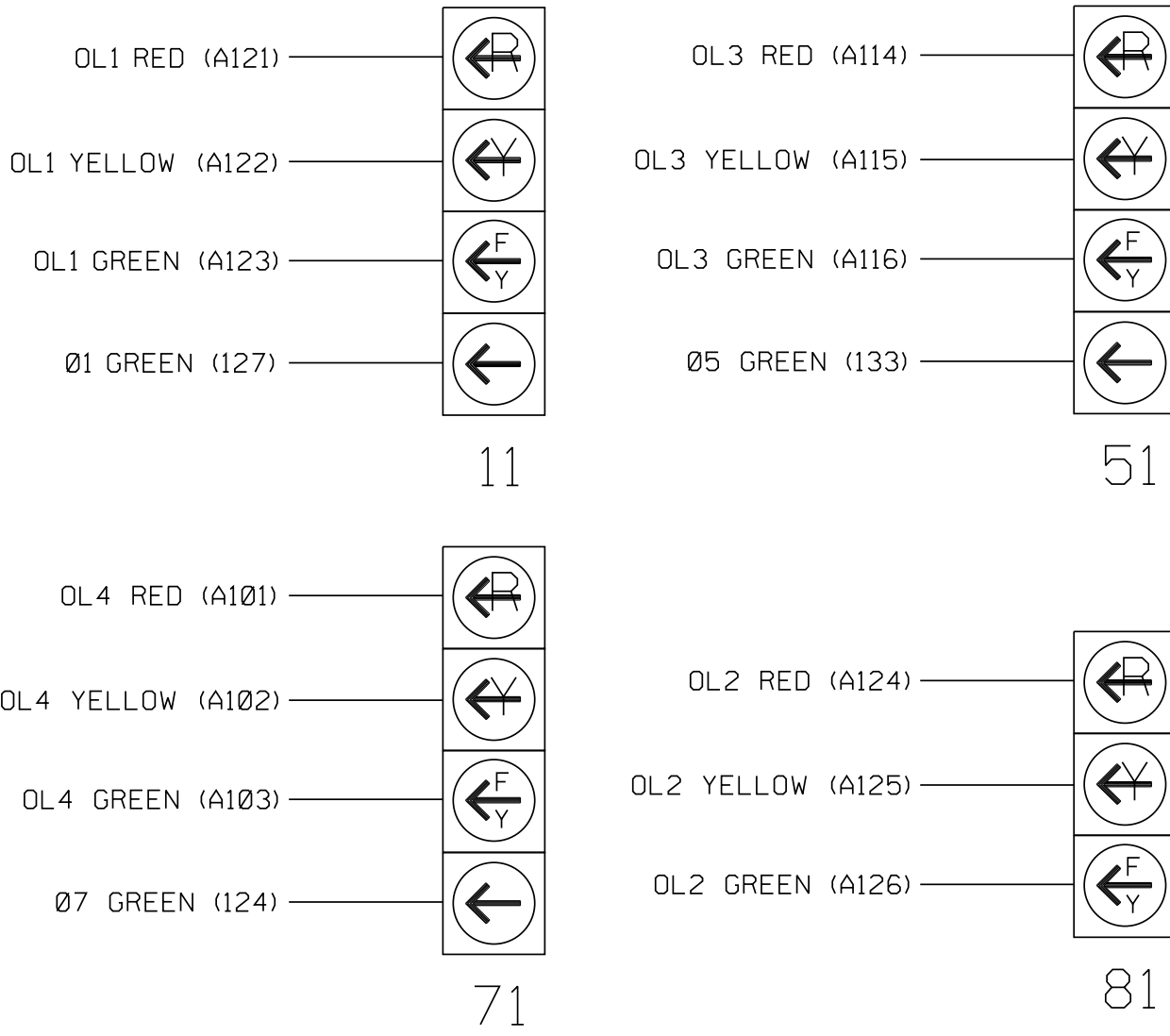
NU = Not Used

* Denotes install load resistor. See load resistor installation detail this sheet.

*See pictorial of head wiring in detail this sheet.

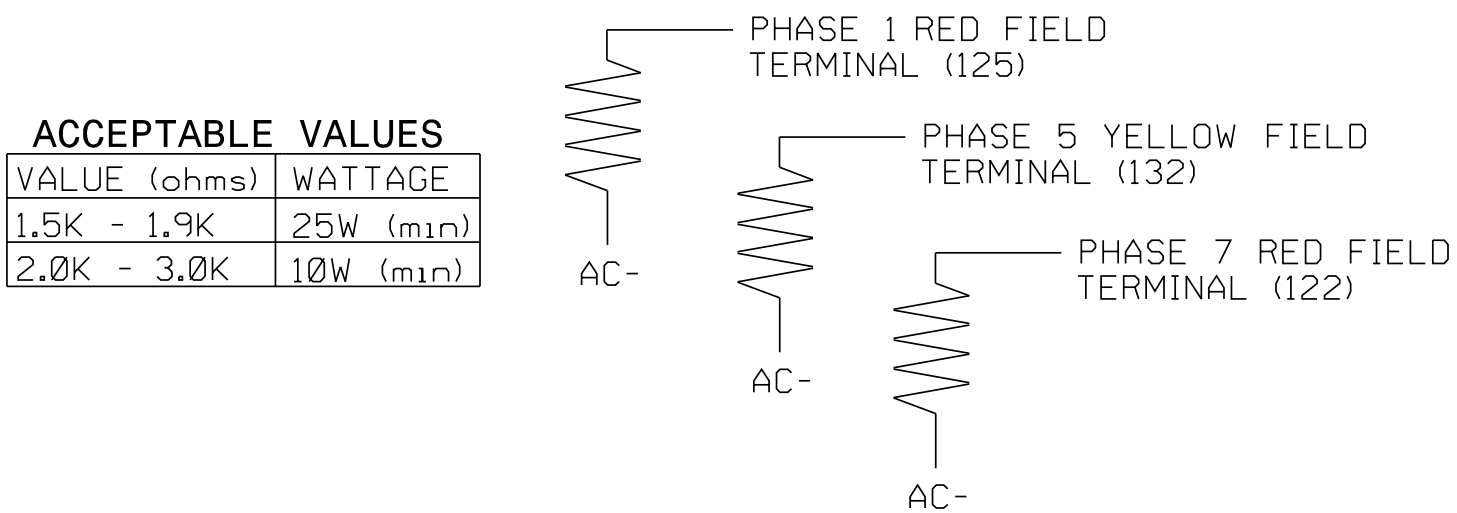
FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)



VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)

Signal Upgrade - Final Design
Electrical Detail - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared for the Offices of:		SEAL	
NC 135 at SR 2177 (Dan Valley Road) and McMichael High School		SEAL 034454	
Division 7 Rockingham County Mayodan		SEAL 034454	
PLAN DATE: August 2025		REVIEWED BY:	
PREPARED BY: Golam Moinuddin		REVIEWED BY:	
REVISIONS		INIT. DATE	
750 N.Greenfield Pkwy,Corner,NC 27529		DATE	
Signed by: Golam Moinuddin		DATE	
SIG. INVENTORY NO. 07-1395		DATE	

Overlap	1	2	3	4
Type	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section
Included Phases	2	4	6	8
Modifier Phases	1	-	5	7
Modifier Overlaps	-	-	-	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

Overlap	1	2	3	4
Type	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section
Included Phases	-	4	-	8
Modifier Phases	1	-	5	7
Modifier Overlaps	-	-	-	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

<u>PHASING</u>	<u>OVERLAP PLAN</u>	<u>VEH DET PLAN</u>
ACTIVE PLAN REQUIRED TO <u>RUN DEFAULT PHASING</u>	1	1
ACTIVE PLAN REQUIRED TO <u>RUN ALTERNATE PHASING</u>	2	2

Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

In the table view of web interface right click on "Detector" in the top left corner of the table. Copy the entire contents of Detector Plan 1. Paste Detector Plan 1 into Detector Plan 2. Modify Detector Plan 2 as shown below and save changes.

Plan 2				Plan 2			
1A	Detector	Call Phase	Delay	5A	Detector	Call Phase	Delay
	1	1	0		15	5	3
	29	0	3		31	0	3

* The Pattern number(s) are to be determined by the Division and/or City Traffic Engineer.

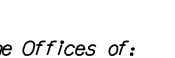
All Red Flash Exit Time
6



Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27606
License No: C-3097

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1395
DESIGNED: August 2025
SEALED: 8/1/2025
REVISED: N/A

Signal Upgrade - Final Design
Electrical Detail - Sheet 2 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:	NC 135 at SR 2177 (Dan Valley Road) and McMichael High School	SEAL 
Prepared for the Offices of:	Division 7 Rockingham County Wayodan PLAN DATE: <u>August 2025</u> REVIEWED BY: _____ PREPARED BY: <u>Golan Moinuddin</u> REVIEWED BY: _____	
 750 N.Greenfield Pkwy, Garner, NC 27529		

PROJECT REFERENCE NO.	SHEET NO.
I-5898	7.0

2 Phase
Fully Actuated
(NC 135 CLS)
Signal System # D07-09_Mayodan

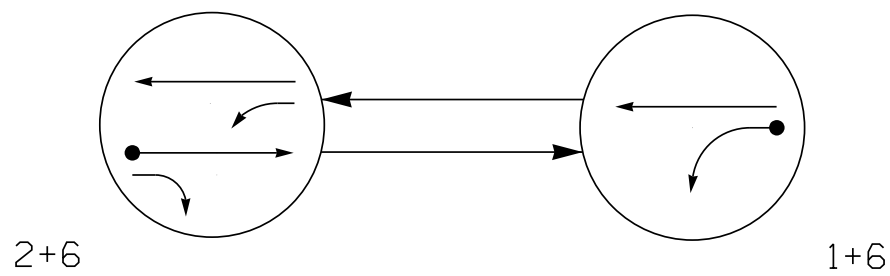
NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Remove existing signalheads numbered 41, 42 and 43
- Reposition existing signalheads numbered 11, 21, 22, 61, 62
- Set all detector units to presence mode.
- This intersection use video detection. Install detectors according to manufacturer's instruction to achieve desired direction.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signalsystem timing values supersede these values.
- Install department-furnished cellular modem and antenna for remote communications. Request cell modem from the Engineer at least 8 weeks before anticipated deployment.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	N/A
	Modified Signal Head	N/A
	Sign	N/A
	Signal Pole with Guy	N/A
	Controller & Cabinet	N/A
	Junction Box	N/A
	2-in Underground Conduit	N/A
	Right of Way	N/A
	Directional Arrow	N/A
	Construction Zone Drums	N/A
	Construction Zone	N/A
	Construction Barricade	N/A
	Non-Intrusive Detection Zone	N/A
	No Right Turn Sign (R3-1)	N/A
	No Left Turn Sign (R3-2)	N/A

PHASING DIAGRAM



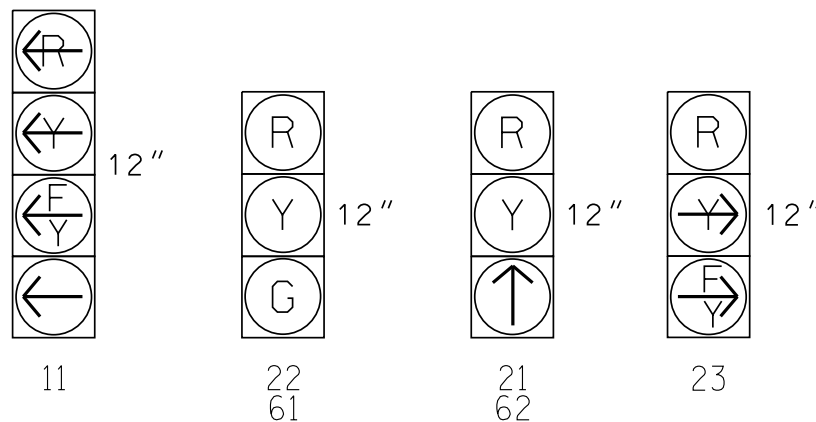
PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT

SIGNAL FACE	PHASE		
	2+6	1+6	FLASH
11			
21			
22			
23			
61			
62			

SIGNAL FACE I.D.

All Heads L.E.D.

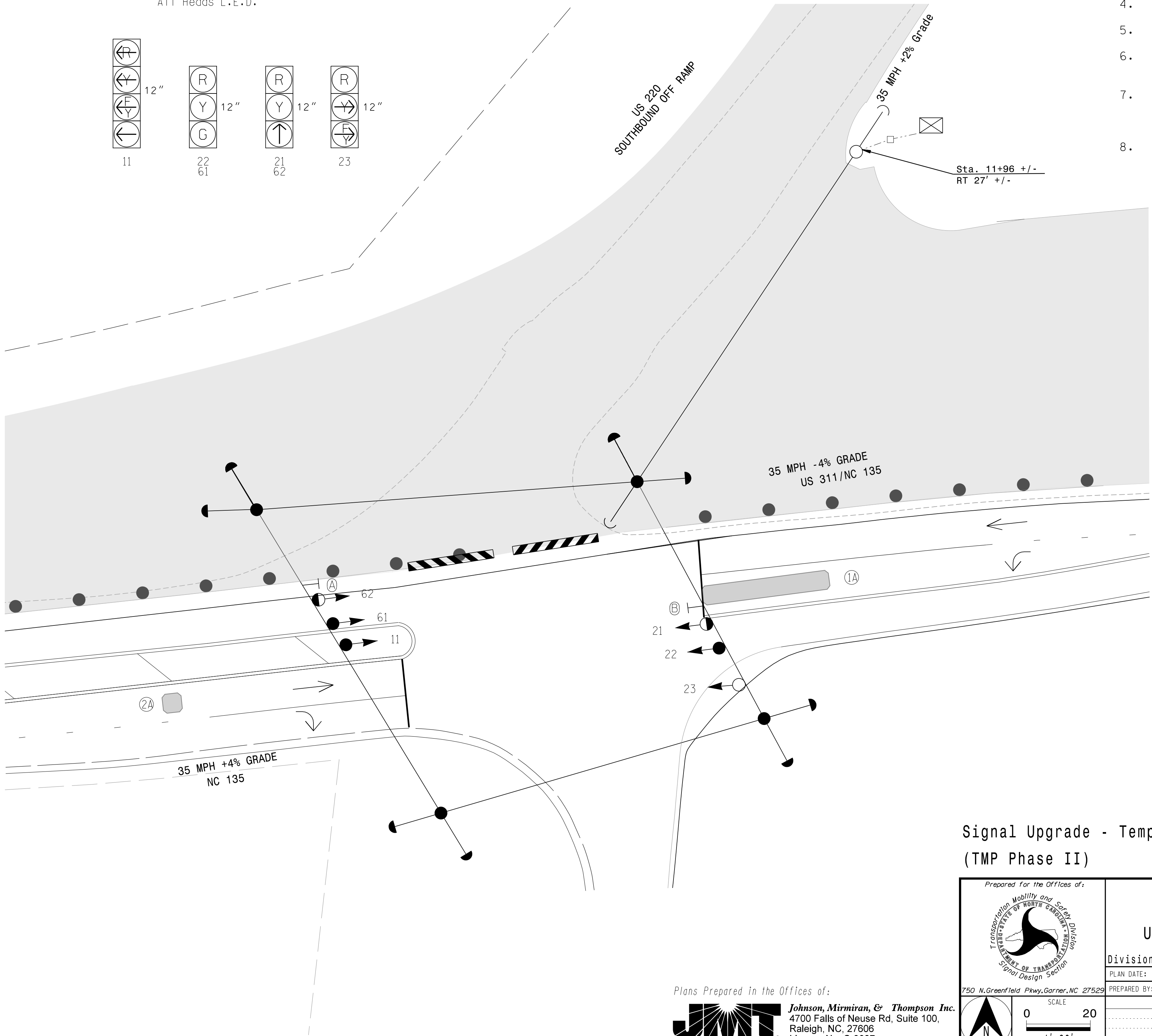


MAXTIME DETECTOR INSTALLATION CHART											
DETECTOR					PROGRAMMING						
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	NEW CARD
1A*	6X40	0	*	*	1	15.0	-	X	-	X	*
2A*	6X6	70	*	*	2	-	-	X	-	X	*

* Video Detection Zone

MAXTIME TIMING CHART				
FEATURE	PHASE			
	1	2	6	
Walk *	-	-	-	
Ped Clear	-	-	-	
Min Green *	7	10	-	
Passage *	2.0	3.0	-	
Max I *	20	60	-	
Yellow Change	3.0	4.1	4.1	
Red Clear	2.3	1.9	1.9	
Added Initial *	-	-	-	
Maximum Initial *	-	-	-	
Time Before Reduction *	-	-	-	
Time To Reduce *	-	-	-	
Minimum Gap	-	-	-	
Advance Walk	-	-	-	
Non Lock Detector	X	-	-	
Vehicle Recall	-	MIN RECALL	MIN RECALL	
Dual Entry	-	-	-	

* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.



Signal Upgrade - Temporary Design 1
(TMP Phase II)

Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

US 311/NC 135
at
US 220 Southbound Ramps

Division 7 Rockingham County Mayodan

PLAN DATE: June 2025 REVIEWED BY:

PREPARED BY: Golam Moinuddin REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE: 0 20
1"=20'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

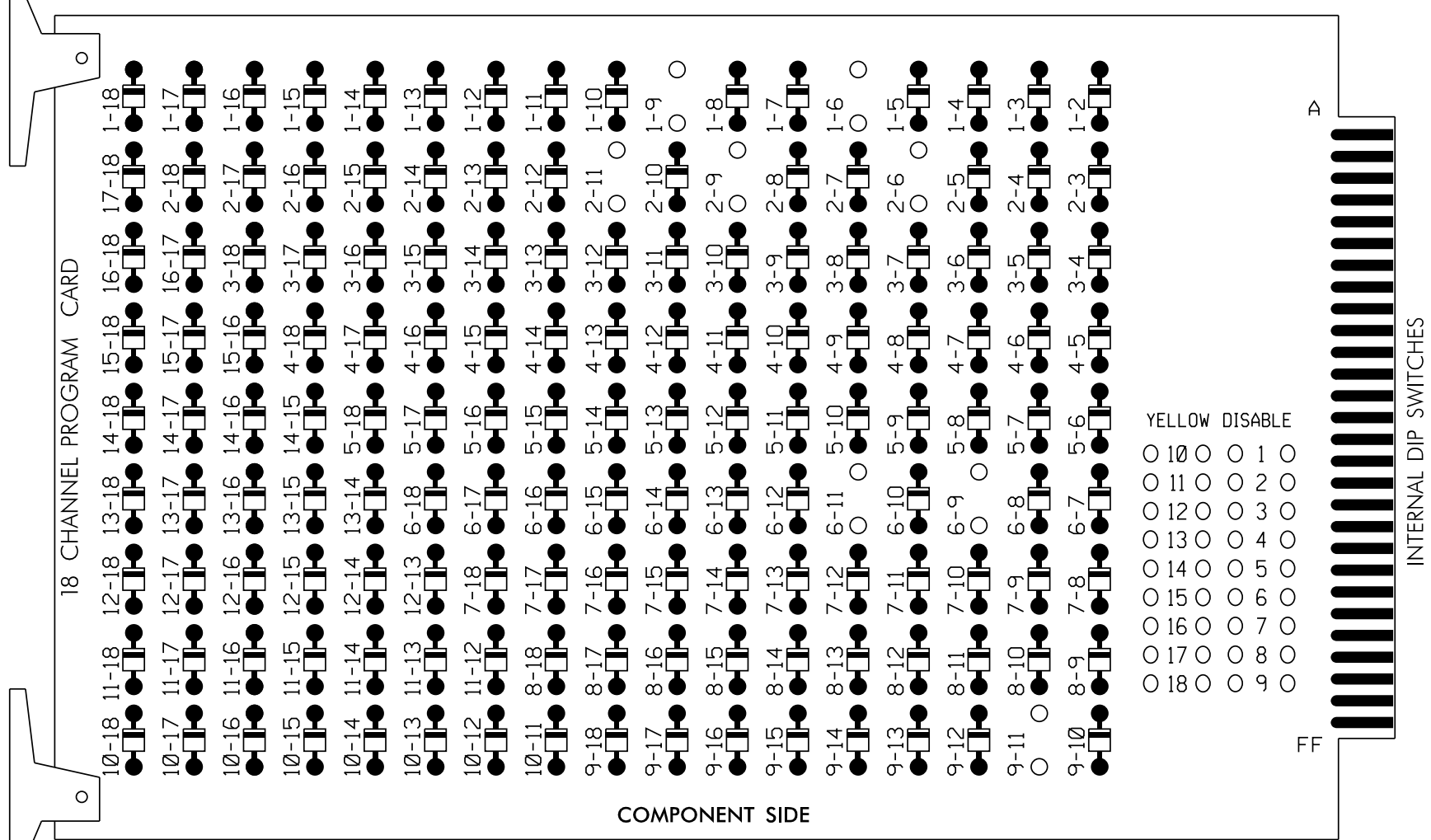
Signed by: Golam Moinuddin
6/30/2025
DATE

SIG. INVENTORY NO. 07-1475 11

18 CHANNEL IP CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

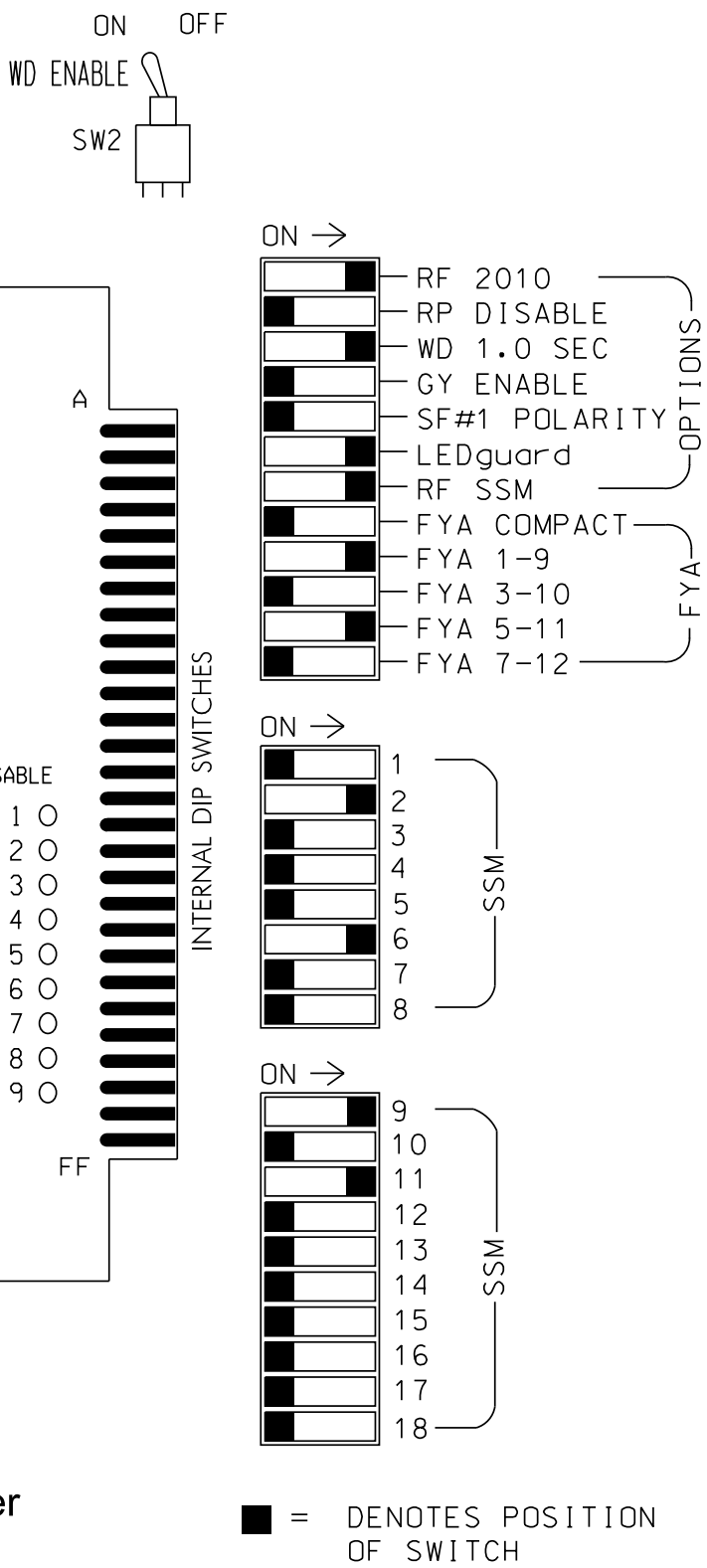
REMOVE DIODE JUMPER 1-6, 1-9, 2-6, 2-9, 2-11, 6-9, 6-11 and 9-11.



REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that the Red Enable is active at all times during normal operation.
- Integrate monitor with Ethernet network in cabinet.



NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
- Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- The cabinet and controller are part of the Signal System #: D07-09-Mayodan

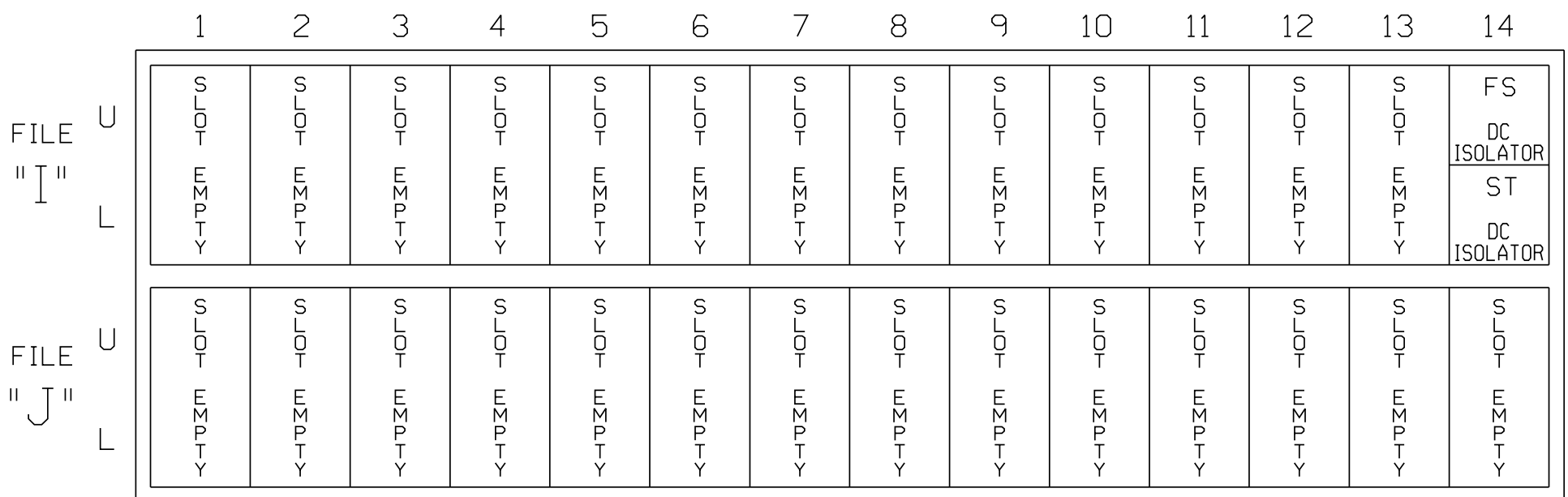
EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S1, S2, S8, AUX S1, AUX S4
Phases Used.....1, 2, 6
Overlap "1".....*
Overlap "2".....NOT USED
Overlap "3".....*
Overlap "4".....NOT USED

*See overlap programming detail

INPUT FILE POSITION LAYOUT

(front view)



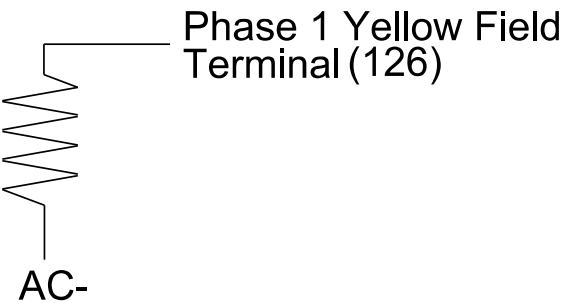
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

ACCEPTABLE VALUES	
Value (ohms)	Wattage
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



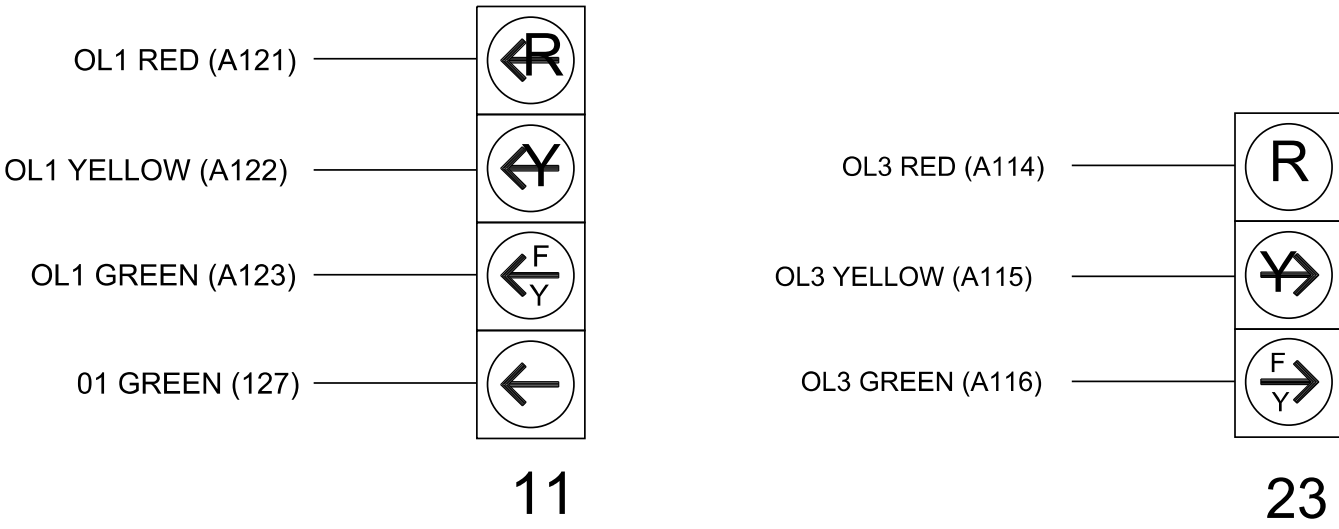
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	11★	21	22	NU	NU	NU	NU	61	62	NU	NU	NU	11★	NU	NU	23★	NU	NU
RED		128	128					134	134									
YELLOW	★	129	129					135	135									
GREEN			130					136										
RED ARROW													A121			A114		
YELLOW ARROW													A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW	127	130							136									

- NU = Not Used
★ Denotes install load resistor. See load resistor installation detail this sheet.
★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1475 T1
DESIGNED: June 2025
SEALED: 6/30/2025
REVISED: N/A

Signal Upgrade - Temp Design 1 (IMP Phase II)
Electrical Detail - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529		SEAL NORTH CAROLINA PROFESSIONAL SEAL 034454 ENGINEER GOLAM M. MOINUDDIN
US 311/NC 135 at US 220 Southbound Ramps		Division 7 Rockingham County Wayodan
PLAN DATE: June 2025 PREPARED BY: Golam Moinuddin		REVIEWED BY: _____ INIT. DATE
REVISIONS		INIT. DATE
6/30/2025		DATE
SIC. INVENTORY NO. 07-1475 T1		

MAXTIME OVERLAP PROGRAMMING DETAIL
FOR DEFAULT PHASING

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	3
Type	FYA 4 - Section	FYA 4- Section
Included Phases	2	2
Modifier Phases	1	-
Modifier Overlaps	-	-
Trail Green	0	0
Trail Yellow	0.0	0.0
Trail Red	0.0	0.0

OUTPUT CHANNEL CONFIGURATION

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

MAXTIME STARTUP AND SOFTWARE FLASH
PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

SPECIAL DETECTOR NOTE

Install a video detection system for vehicle detection.
Perform installation according to manufacturer's directions and
NCDOT engineer approved mounting locations to accomplish the
detection schemes shown on the Signal Design Plans.

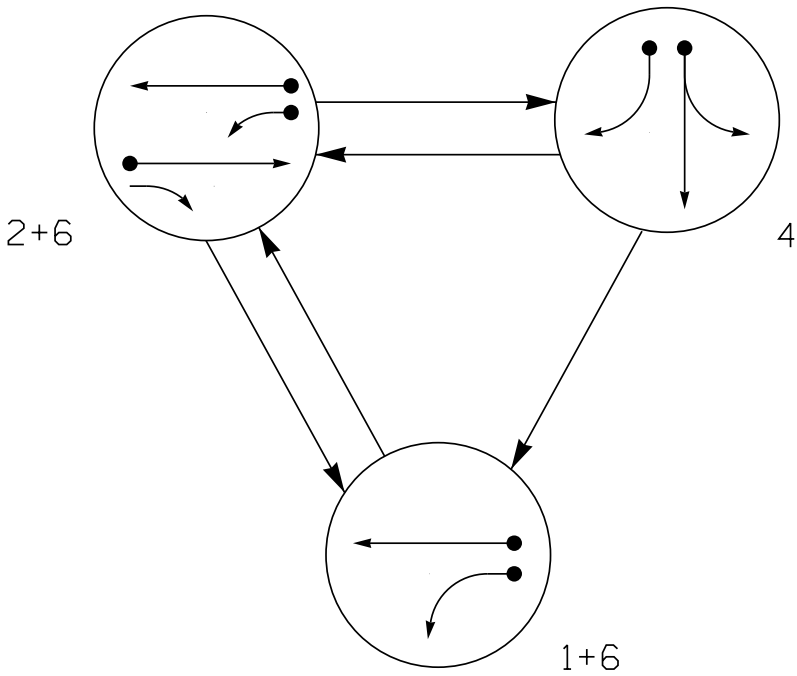
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1475 T1
DESIGNED: June 2025
SEALED: 6/30/2025
REVISED: N/A

Signal Upgrade - Temp Design 1 (IMP Phase II)-----
Electrical Detail - Sheet 2 of 2-----

ELECTRICAL AND PROGRAMMING DETAILS FOR:		US 311/NC 135 at US 220 Southbound Ramps		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529		Division 7 Rockingham County Wayodan			
PLAN DATE: June 2025		REVIEWED BY:			
PREPARED BY: Golan Moinuddin		REVIEWED BY:			
REVISIONS		INIT. DATE			
				Signed by:  6/30/2025 DATE	
				SIG. INVENTORY NO. 07-1475 T1	

Prepared in the Offices of:
 **Johnson, Mirmiran, & Thompson Inc.**
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27606
License No: C-3097

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE			
	1 + 6	2 + 6	4	FLASH
11	← F →	← F →	← F →	← F →
21	R	↑	R	R
22	R	G	R	R
23	R	F	R	R
41,42,43	R	R	G	R
61	G	G	R	R
62	↑	↑	R	R

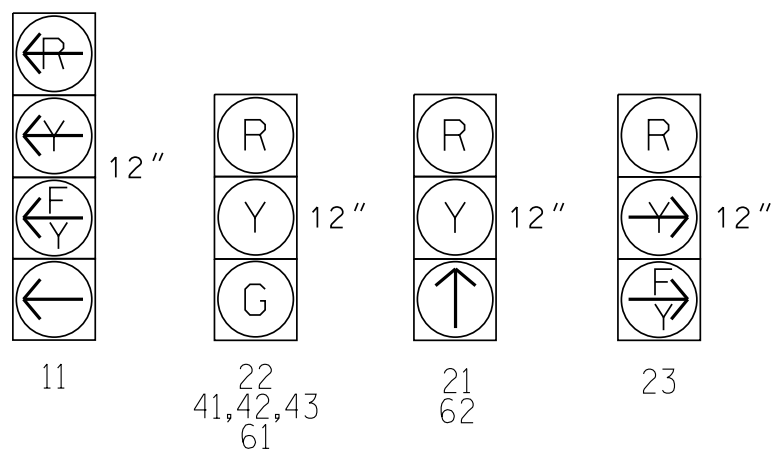
MAXTIME DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
1A*	6X40	0	*	-	1	15.0	-	X	-	X	-	-
					6	-	-	X	-	X	-	*
2A*	6X6	70	*	-	2	-	-	X	-	X	-	-
4A*	6X40	0	*	*	4	-	-	X	-	X	-	*
4B*	6X40	0	*	*	4	15.0	-	X	-	X	-	*
6A*	6X6	70	*	*	6	-	-	X	-	X	-	*

* Video Detection Zone

SIGNAL FACE I.D.

All Heads L.E.D.



MAXTIME TIMING CHART

FEATURE	PHASE			
	1	2	4	6
Walk *	-	-	-	-
Ped Clear	-	-	-	-
Min Green *	7	10	7	10
Passage *	2.0	3.0	2.0	3.0
Max 1 *	20	60	40	60
Yellow Change	3.0	4.1	3.7	4.1
Red Clear	1.6	1.9	1.0	1.9
Added Initial *	-	-	-	-
Maximum Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Advance Walk	-	-	-	-
Non Lock Detector	X	-	X	-
Vehicle Recall	-	MIN RECALL	-	MIN RECALL
Dual Entry	-	-	-	-

* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

3 Phase
Fully Actuated
(NC 135 CLS)
Signal System # D07-09_Mayodan

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 may be lagged.
- Set all detector units to presence mode.
- The intersection uses video detection. Install detectors according to the manufacturer's instructions to achieve desired detection.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED

- Traffic Signal Head Sign
- Signal Pole with Guy
- Controller & Cabinet Junction Box
- 2-in Underground Conduit
- N/A Right of Way
- Directional Arrow
- N/A Guardrail
- Construction Zone Drums
- Construction Zone
- Non-Intrusive Detection Zone
- No Right Turn Sign (R3-1)
- No Left Turn Sign (R3-2)

EXISTING

- Traffic Signal Head Sign
- Signal Pole with Guy
- Controller & Cabinet Junction Box
- 2-in Underground Conduit
- N/A Right of Way
- Directional Arrow
- N/A Guardrail
- Construction Zone Drums
- Construction Zone
- Non-Intrusive Detection Zone
- No Right Turn Sign (R3-1)
- No Left Turn Sign (R3-2)

Signal Upgrade - Temporary Design 2
(TMP Phase III)

Prepared for the Offices of:

Transportation Mobility and Safety Division
UNIVERSITY OF NORTH CAROLINA
SIGNAL DESIGN SECTION

750 N. Greenfield Pkwy, Garner, NC 27529

0 SCALE 1"=20'

US 311/NC 135
at
US 220 Southbound Ramps

Division 7 Rockingham County Mayodan

PLAN DATE: June 2025 REVIEWED BY:

PREPARED BY: Golam Moinuddin REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

PROFESSIONAL ENGINEER
SEAL 034454
GOLAM M. MOINUDDIN

Signed by: Golam Moinuddin
6/30/2025
DATE

SIG. INVENTORY NO. 07-1475 T2

MAXTIME OVERLAP PROGRAMMING DETAIL
FOR DEFAULT PHASING

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	3
Type	FYA 4 - Section	FYA 4- Section
Included Phases	2	2
Modifier Phases	1	-
Modifier Overlaps	-	-
Trail Green	0	0
Trail Yellow	0.0	0.0
Trail Red	0.0	0.0

OUTPUT CHANNEL CONFIGURATION

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

MAXTIME STARTUP AND SOFTWARE FLASH
PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1475 T2
DESIGNED: June 2025
SEALED: 6/30/2025
REVISED: N/A

Signal Upgrade - Temp Design 2 (IMP Phase III)
Electrical Detail - Sheet 2 of 2

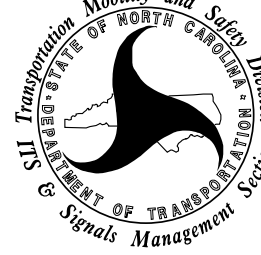
Prepared in the Offices of:



Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27606
License No: C-3097

ELECTRICAL AND PROGRAMMING
DETAILS FOR:

Prepared for the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

US 311/NC 135
at
US 220 Southbound Ramps

Division 7Rockingham CountyWayodan

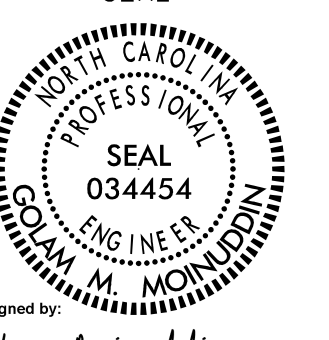
PLAN DATE: June 2025REVIEWED BY:

PREPARED BY: Golam MoinuddinREVIEWED BY:

REVISIONSINIT. DATE

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

SEAL



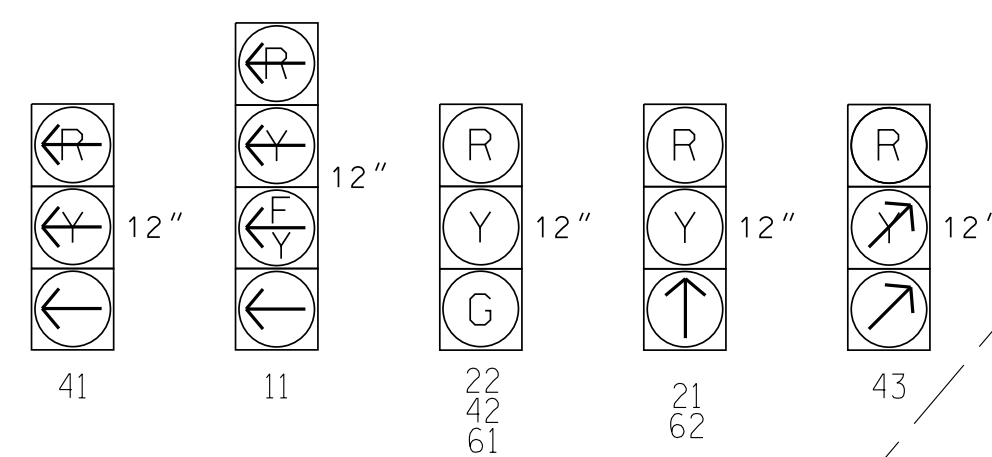
Signed by:
Golam Moinuddin
6/30/2025

SIG. INVENTORY NO. 07-1475 T2

SIGNAL FACE I.D.

All Heads L.E.D.

 DETECTED MOVEMENT
 UNDETECTED MOVEMENT (OVERLAP)
 UNSIGNALIZED MOVEMENT



DETECTOR					PROGRAMMING								
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED	INITIAL	CALL	DELAY DURING GREEN	NEW CALL
1A*	6X40	0	*	-	1	15.0	-	X	-	X	-		
					6	-	-	X	-	X	-		
2A*	6X6	70	*	-	2	-	-	X	-	X	-		
4A*	6X40	0	*	-	4	-	-	X	-	X	-		
4B*	6X40	0	*	-	4	15.0	-	X	-	X	-		
6A*	6X6	70	*	-	6	-	-	X	-	X	-		

* Video Detection Zone

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase I may be lagged.
4. Set all detector units to presence mode.
5. The intersection uses video detection. Install detectors according to the manufacturer's instructions to achieve desired detection.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PROPOSED		EXISTING
	Traffic Signal Head	
	Sign	
	Signal Pole with Guy	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
N/A	Guardrail	
	Construction Zone Drums	
	Construction Zone	N/A
	Construction Barricade	N/A
	Non-Intrusive Detection Zone	
N/A	Curb Ramp	
	No Right Turn Sign (R3-1)	
	No Left Turn Sign (R3-2)	

* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade - Temporary Design 3
(TMP Phase IV - Step 1)

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

Plans Prepared in the Offices of:

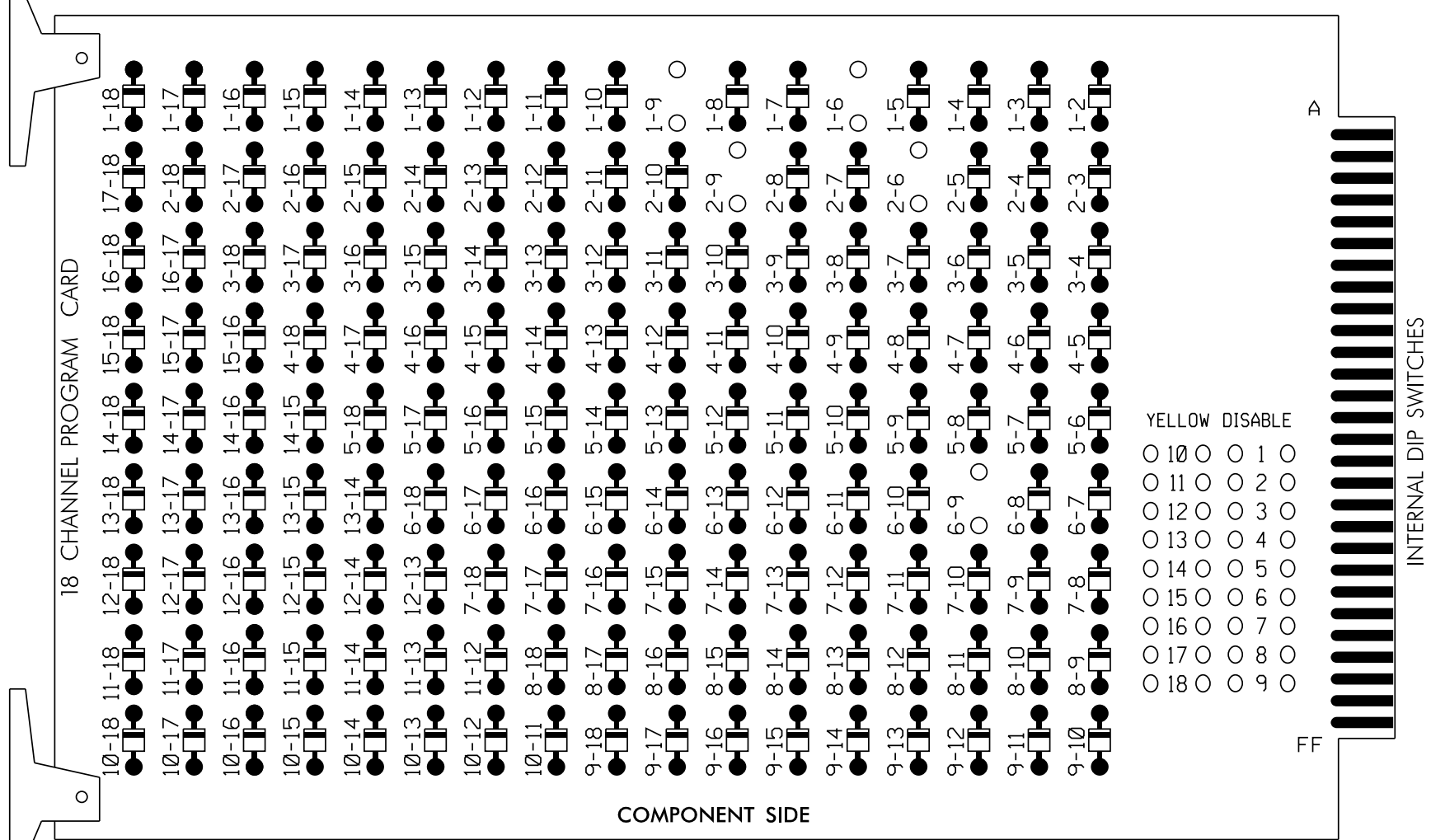
JMT  **Johnson, Mirmiran, & Thompson Inc.**
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27606
License No: C-3097

Prepared for the Offices of: 	US 311/NC 135 at US 220 Southbound Ramps	SEAL 																																	
Division 7 Rockingham County Mayodan																																			
PLAN DATE: <u>June 2025</u> REVIEWED BY:																																			
PREPARED BY: <u>Golam Moinuddin</u> REVIEWED BY:																																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">REVISIONS</th> <th style="width: 20%;">INIT.</th> <th style="width: 20%;">DATE</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>			REVISIONS	INIT.	DATE																														
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750 N.Greenfield Pkwy, Garner, NC 27529																																			
 SCALE 0 20 1" = 20'																																			
Signed by:  6/30/2025 PROFESSIONAL ENGINEER SIGNATURE: DATE																																			
SIG. INVENTORY NO. 07-1475 1																																			

18 CHANNEL IP CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

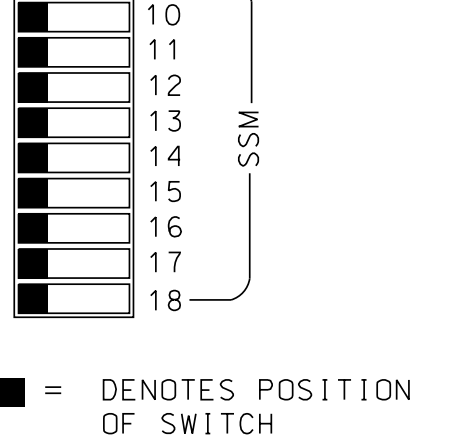
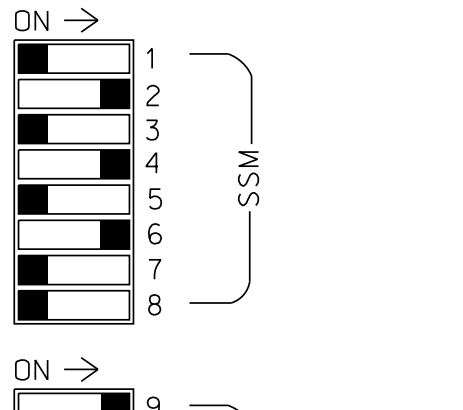
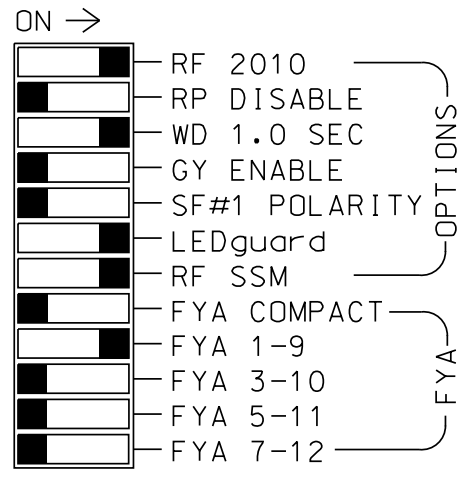
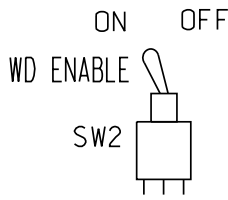
REMOVE DIODE JUMPERS 1-6, 1-9, 2-6, 2-9 and 6-9.



REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that the Red Enable is active at all times during normal operation.
- Integrate monitor with Ethernet network in cabinet.



■ = DENOTES POSITION OF SWITCH

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
- Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- The cabinet and controller are part of the Signal System #: D07-09_Mayodan

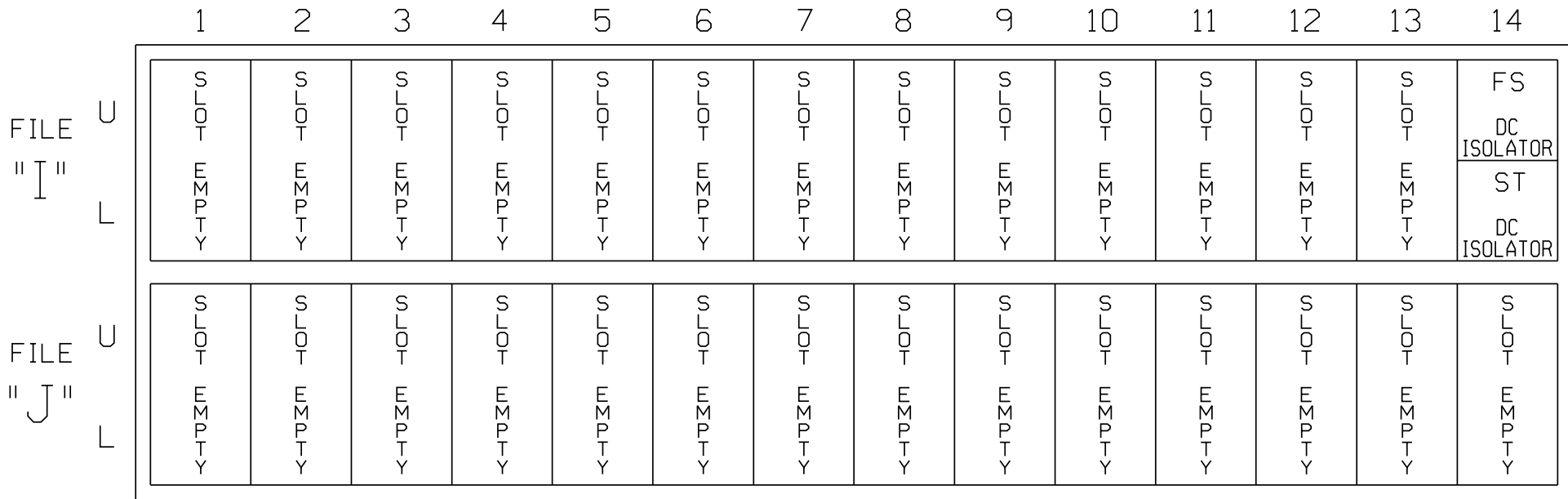
EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S1, S2, S5, S8, AUX S1
Phases Used.....1, 2, 4, 6
Overlap "1".....*
Overlap "2".....NOT USED
Overlap "3".....NOT USED
Overlap "4".....NOT USED

*See overlap programming detail

INPUT FILE POSITION LAYOUT

(front view)



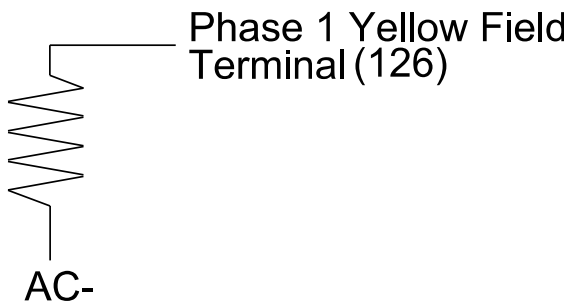
EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

ACCEPTABLE VALUES	
Value (ohms)	Wattage
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



SIGNAL HEAD HOOK-UP CHART

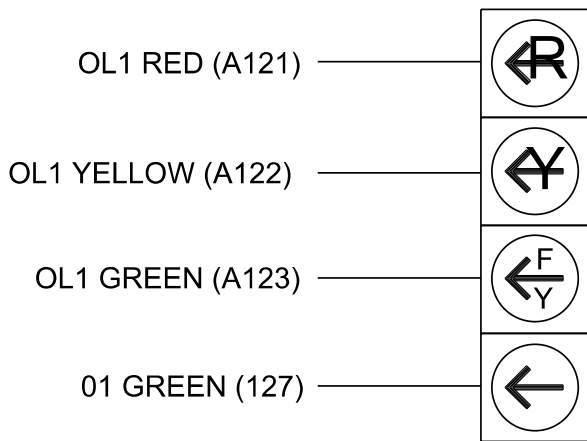
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	11	21	22	NU	NU	41	42	43	NU	NU	61	62	NU	NU	NU	NU	NU	NU
RED		128	128			101	101				134	134						
YELLOW	*	129	129			102					135	135						
GREEN			130			103					136							
RED ARROW					101								A121					
YELLOW ARROW					102	102							A122					
FLASHING YELLOW ARROW													A123					
GREEN ARROW	127	130			103	103					136							

NU = Not Used

- * Denotes install load resistor. See load resistor installation detail this sheet.
- * See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



11

SPECIAL DETECTOR NOTE

Install a video detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1475 T3
DESIGNED: June 2025
SEALED: 6/30/2025
REVISED: N/A

Signal Upgrade -- Temp Design 3 (TMP Phase IV -- Step 1) --
Electrical Detail -- Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529		US 311/NC 135 at US 220 Southbound Ramps Division 7 Rockingham County Wayodan PLAN DATE: June 2025 REVIEWED BY: PREPARED BY: Golam Moinuddin REVIEWED BY: REVISIONS INIT. DATE SIGNED BY: Golam Moinuddin 6/30/2025 DATE SIG. INVENTORY NO. 07-1475 T3	

MAXTIME OVERLAP PROGRAMMING DETAIL
FOR DEFAULT PHASING

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1
Type	FYA 4 - Section
Included Phases	2
Modifier Phases	1
Modifier Overlaps	-
Trail Green	0
Trail Yellow	0.0
Trail Red	0.0

OUTPUT CHANNEL CONFIGURATION

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

MAXTIME STARTUP AND SOFTWARE FLASH
PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1475 T3
DESIGNED: June 2025
SEALED: 6/30/2025
REVISED: N/A

Signal Upgrade - Temp Design 3 (TMP Phase IV - Step 1)
Electrical Detail - Sheet 2 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:		US 311/NC 135 at US 220 Southbound Ramps		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529		Division 7Rockingham CountyWayodan PLAN DATE: June 2025REVIEWED BY: PREPARED BY: Golan MoinuddinREVIEWED BY: REVISIONSINIT. DATE		SEAL NORTH CAROLINA PROFESSIONAL SEAL 034454 ENGINEER GOLAN M. MOINUDDIN Signed by:  6/30/2025 DATE SIG. INVENTORY NO. 07-1475 T3	

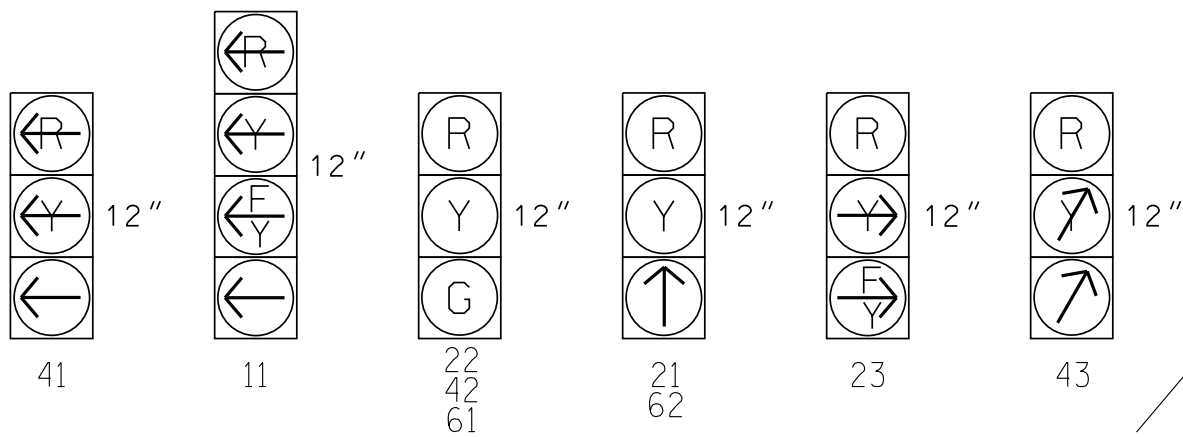
SIGNAL FACE	PHASE			
	1 + 6	2 + 6	4	FLASH
11	←	↖	←	←
21	R	↑	R	R
22	R	G	R	R
23	R	↖	R	R
41	←	←	←	←
42	R	R	G	R
43	R	R	↗	R
61	G	G	R	R
62	↑	↑	R	R

DETECTOR					PROGRAMMING						
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL CALL	DELETED GREEN	NEW CARD
1A*	6X40	0	*	-	1	15.0	-	X	-	X	-
					6	-	-	X	-	X	-
2A*	6X6	70	*	-	2	-	-	X	-	X	-
4A*	6X40	0	*	-	4	-	-	X	-	X	-
4B*	6X40	0	*	-	4	15.0	-	X	-	X	-
6A*	6X6	70	*	-	6	-	-	X	-	X	-

* Video Detection Zone

 DETECTED MOVEMENT
 UNDETECTED MOVEMENT (OVERLAP)
 UNSIGNALIZED MOVEMENT

All Heads L.E.D.



MAXTIME TIMING CHART				
FEATURE	PHASE			
	1	2	4	6
Walk *	–	–	–	–
Ped Clear	–	–	–	–
Min Green *	7	10	7	10
Passage *	2.0	3.0	2.0	3.0
Max 1 *	20	60	40	60
Yellow Change	3.0	4.1	3.0	4.1
Red Clear	3.4	2.7	2.6	2.7
Added Initial *	–	–	–	–
Maximum Initial *	–	–	–	–
Time Before Reduction *	–	–	–	–
Time To Reduce *	–	–	–	–
Minimum Gap	–	–	–	–
Advance Walk	–	–	–	–
Non Lock Detector	X	–	X	–
Vehicle Recall	–	MIN RECALL	–	MIN RECALL
Dual Entry	–	–	–	–

* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

PROPOSED		EXISTING
	Traffic Signal Head Sign	
	Signal Pole with Guy Controller & Cabinet Junction Box	
	2-in Underground Conduit	
	Right of Way	
N/A	Directional Arrow	
	Guardrail	
	Construction Zone Drums	
	Construction Zone	N/A
	Non-Intrusive Detection Zone	
N/A	Curb Ramp	
	No Right Turn Sign (R3-1)	
	No U-Turn/No Left Turn Sign (R3-18)	

Signal Upgrade - Temporary Design 4
(TMP Phase IV - Step 2)

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

Plans Prepared in the Offices of:

Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27606
License No: C-3097

Prepared for the Offices of:

Transportation Mobility and Safety Division
DEPARTMENT OF TRANSPORTATION
SIGNAL DESIGN SECTION

750 N. Greenfield Pkwy, Garner, NC 27525

SCALE

0 2

1" = 20'

US 311/NC 135
at
US 220 Southbound Ramps

Division 7 Rockingham County Mayodan

PLAN DATE:	August 2025
------------	-------------

REVIEWED BY:

REVISIONS

DATE

SEAL

NORTH CAROLINA
PROFESSIONAL
SEAL
034454
ENGINEER
GOLAM M. MOINUDDIN

Signed by:

Golam MoINUDDIN

92897C0827ED4C

8/1/20

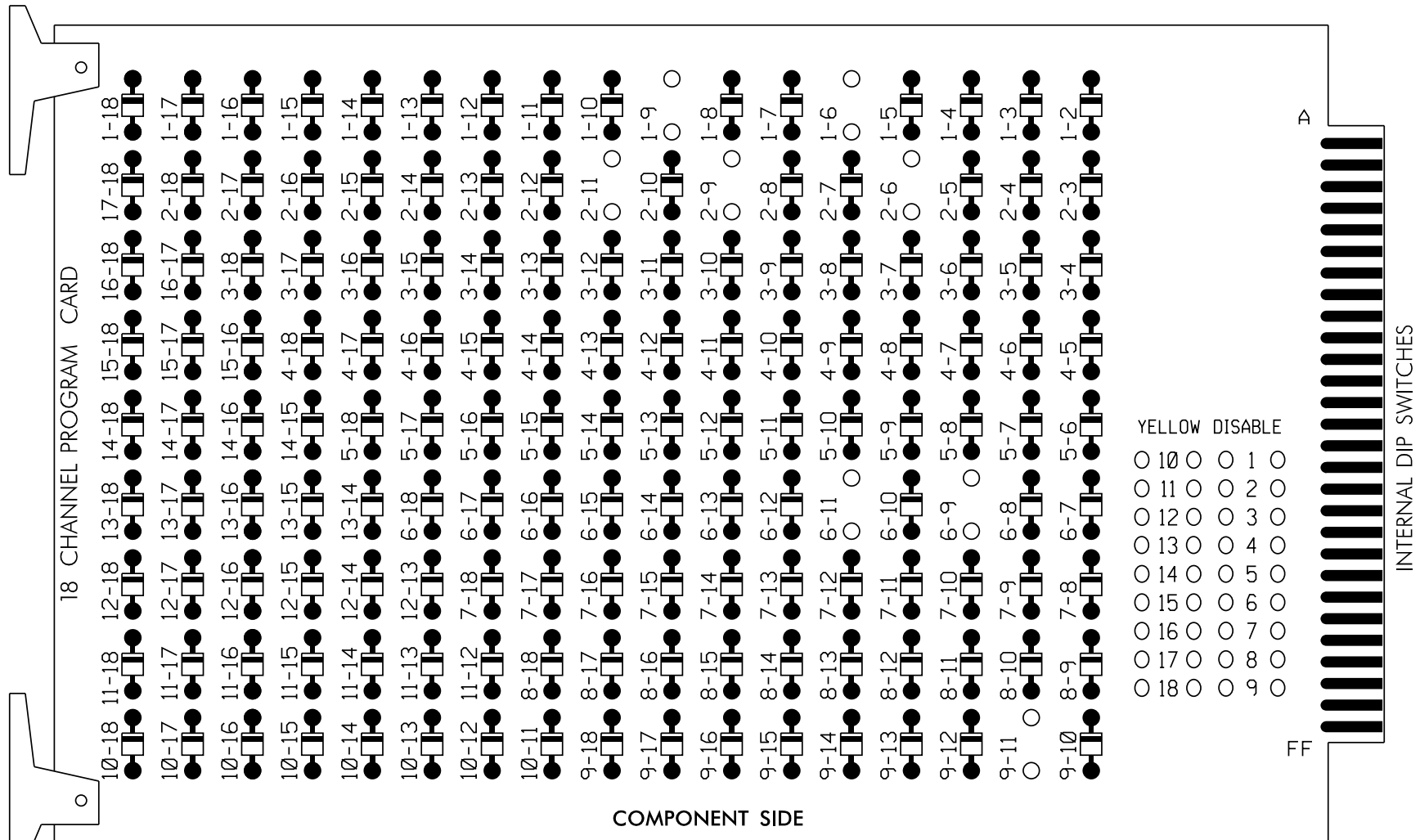
SIGNATURE DATE

SIG. INVENTORY NO. 07-1475

SIG. INVENTORY NO. 07-1475 14

(remove jumpers and set switches as shown)

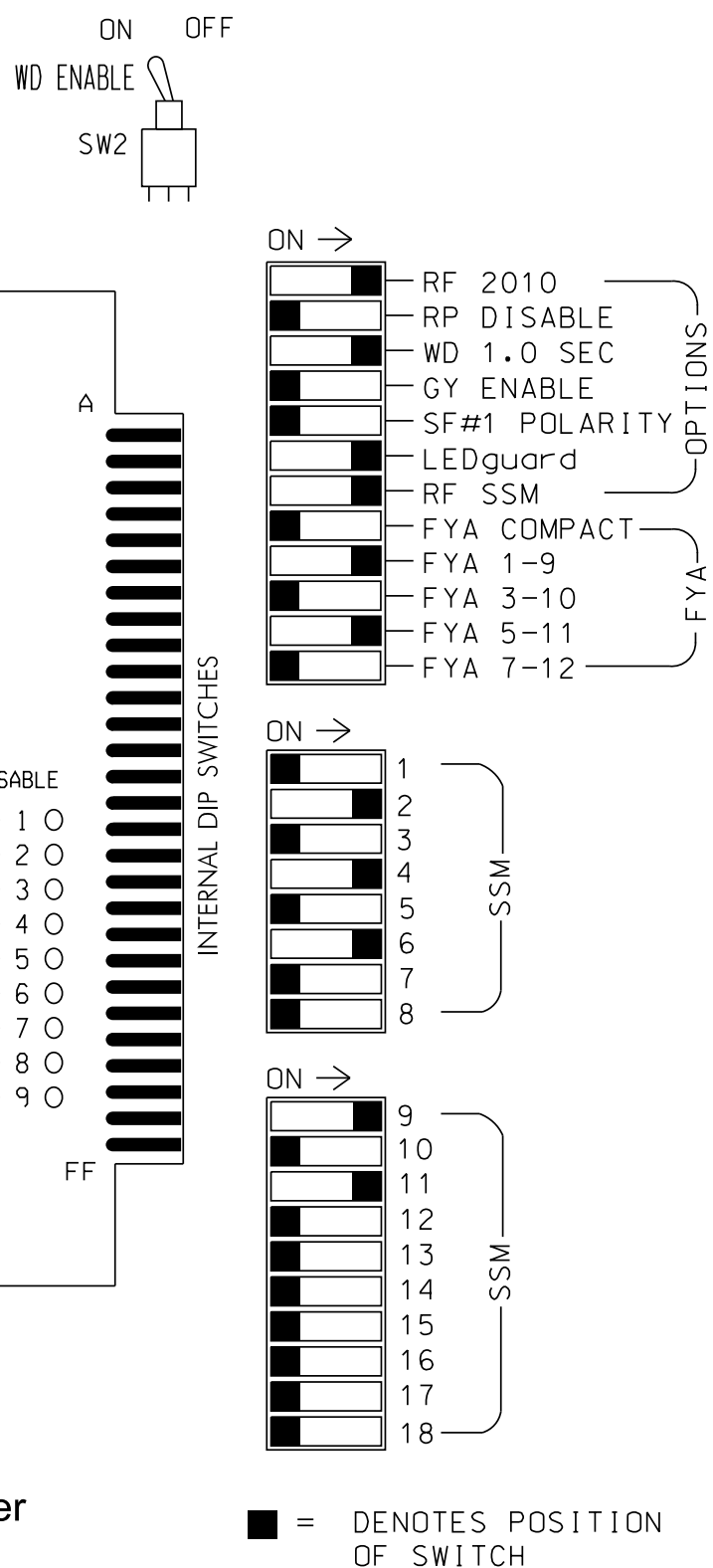
REMOVE DIODE JUMPER 1-6, 1-9, 2-6, 2-9, 2-11, 6-9, 6-11 and 9-11.



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that the Red Enable is active at all times during normal operation.
4. Integrate monitor with Ethernet network in cabinet.



NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
3. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
4. The cabinet and controller are part of the Singal System #: D07-09-Mayodan

EQUIPMENT INFORMATION

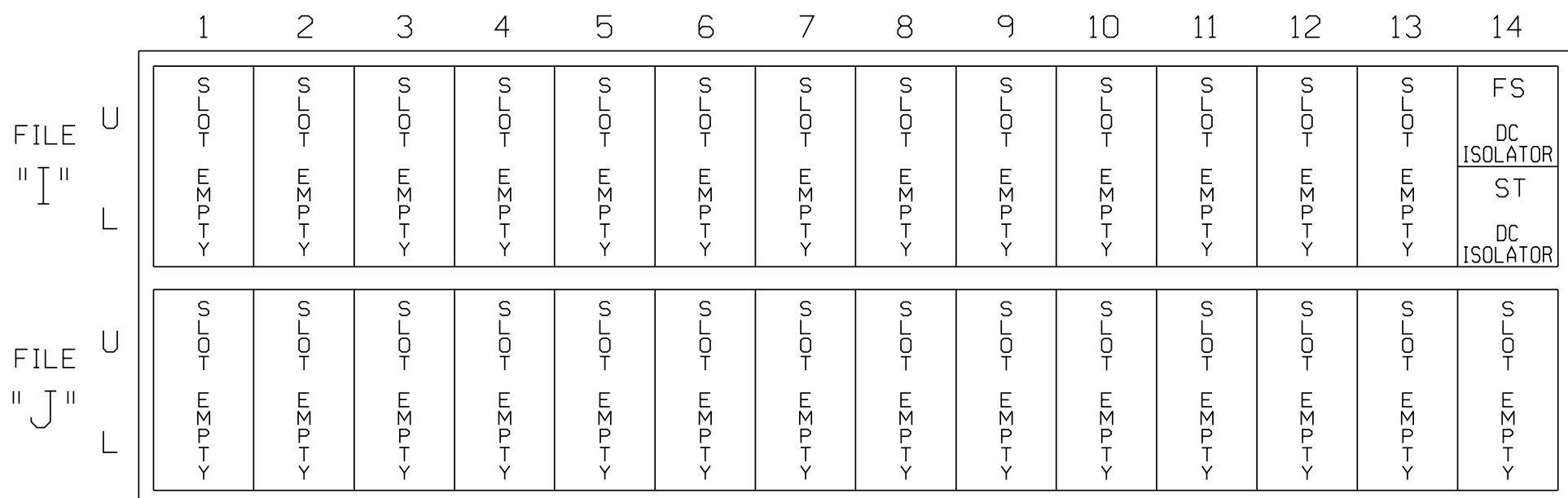
Controller.....	2070LX
Cabinet.....	332 w/ Aux
Software.....	Q-Free MAXTIME
Cabinet Mount.....	Base
Output File Positions.....	18 With Aux. Output File
Load Switches Used.....	S1, S2, S5, S8, AUX S1, AUX S4

Phases Used.....1, 2, 4, 6
 Overlap "1".....*
 Overlap "2".....NOT USED
 Overlap "3".....*
 Overlap "4".....NOT USED

*See overlap programming detail

INPUT FILE POSITION LAYOUT

(front view)

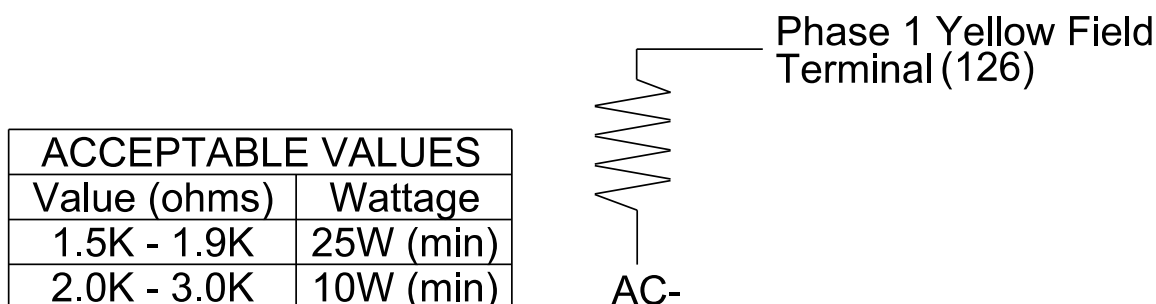


EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)



SIGNAL HEAD HOOK-UP CHART

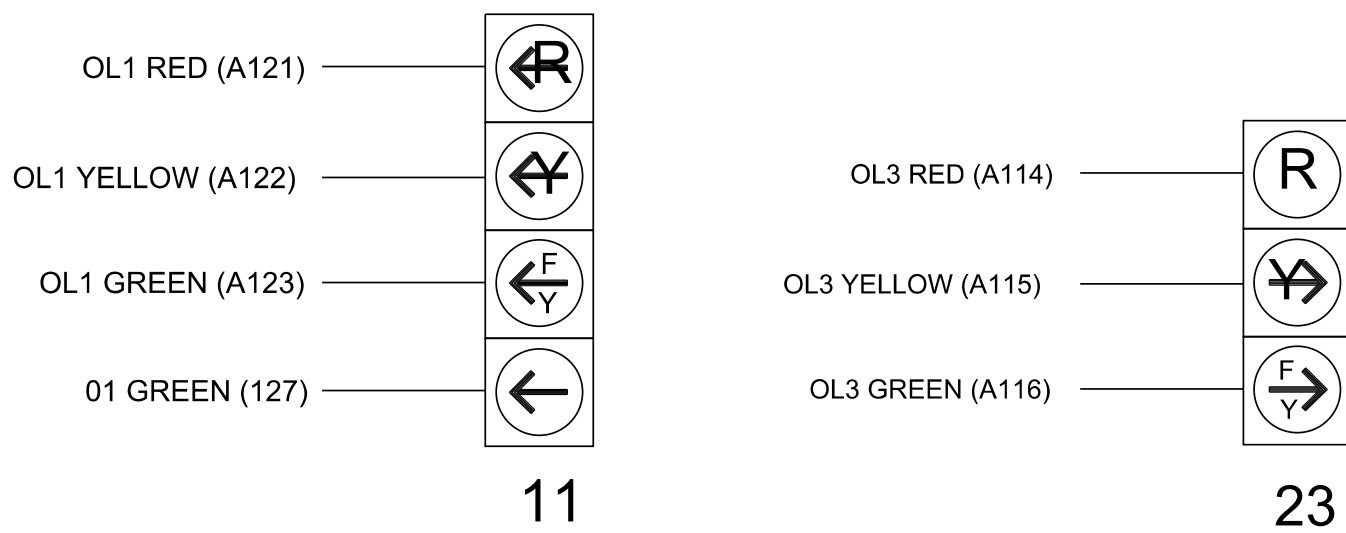
[illegible]

NU = Not Used

- * Denotes install load resistor. See load resistor installation detail this sheet.
★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)

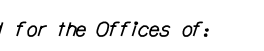


SPECIAL DETECTOR NOTE

Install a video detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1475 T4
DESIGNED: August 2025
SEALED: 8/1/2025
REVISED: N/A

Signal Upgrade - Temp Design 4 (TMP Phase IV - Step 2)
Electrical Detail - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:	US 311/NC 135 at US 220 Southbound Ramps	SEAL 																																	
Prepared for the Offices of: 	Division 7 Rockingham County Mayodan																																		
	PLAN DATE: <u>August 2025</u> REVIEWED BY: _____																																		
	PREPARED BY: <u>Golam Moinuddin</u> REVIEWED BY: _____																																		
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">REVISIONS</th> <th style="width: 20%;">INIT.</th> <th style="width: 20%;">DATE</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	REVISIONS	INIT.	DATE																															
REVISIONS	INIT.	DATE																																	
750 N.Greenfield Pkwy,Garner, NC 27529		Signed by:  12097-CB072E4HC 8/1/2025 DATE																																	
		SIG. INVENTORY NO. 07-1475 T4																																	

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Overlap Plan 1

Type	FYA 4 - Section	FYA 4- Section
Included Phases	2	2
Modifier Phases	1	-
Modifier Overlaps	-	-
Trail Green	0	0
Trail Yellow	0.0	0.0
Trail Red	0.0	0.0

Channel Configuration

1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1475 T4
DESIGNED: August 2025
SEALED: 8/1/2025
REVISED: N/A

Signal Upgrade - Temp Design 4 (TMP Phase IV - Step 2)
Electrical Detail - Sheet 2 of 2

**DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED**



Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27606
License No: C-3097

Prepared for the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

Division 7 Rockingham County Mayodan

PLAN DATE: August 2025	REVIEWED BY: _____
------------------------	--------------------

REVISIONS

INIT.	DATE
-------	------

SEAL



North Carolina
Professional Engineer
SEAL
034454
M. MOINUDDIN

Signed by:

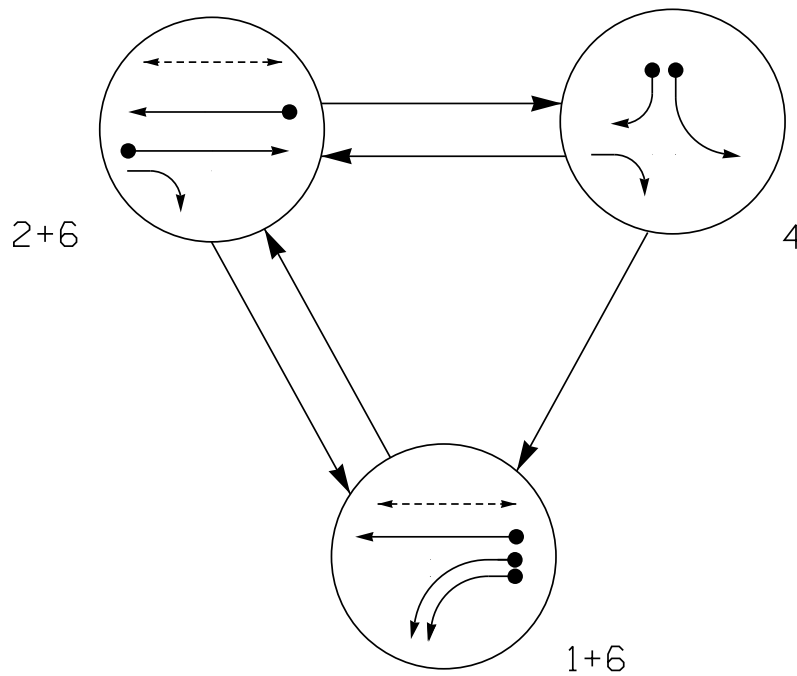
M. Moineuddin

92897C8B27ED4E...

8/1/

SIG. INVENTORY NO. 07-1475 T4

PHASING DIAGRAM



SIGNAL FACE	PHASE			
	1 + 6	2 + 6	4	FLASH
11,12	←	←R	←R	←R
21	R	↑	R	R
22	R	G	R	R
23	R	→	→	R
41	←R	←R	←	←R
42	R	R	G	R
43	R	R	/	R
61	G	G	R	R
62	↑	↑	R	R
P61,P62	W	W	DW	DRK

MAXTIME DETECTOR INSTALLATION CHART										
DETECTOR					PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL CALL	NEW CARD
1A	6X40	0	2-4-2	X	1	3.0	-	X	-	X
1B	6X40	0	2-4-2	X	1	-	-	X	-	X
2A	6X6	250	5	X	2	-	-	X	X	X
4A	6X40	0	2-4-2	X	4	-	-	X	-	X
4B	6X40	0	2-4-2	X	4	15.0	-	X	-	X
6A	6X6	250	4	X	6	-	-	X	X	X

3 Phase
Fully Actuated
(NC 135 CLS)
Signal System # D07-09_Mayodan

NOTES

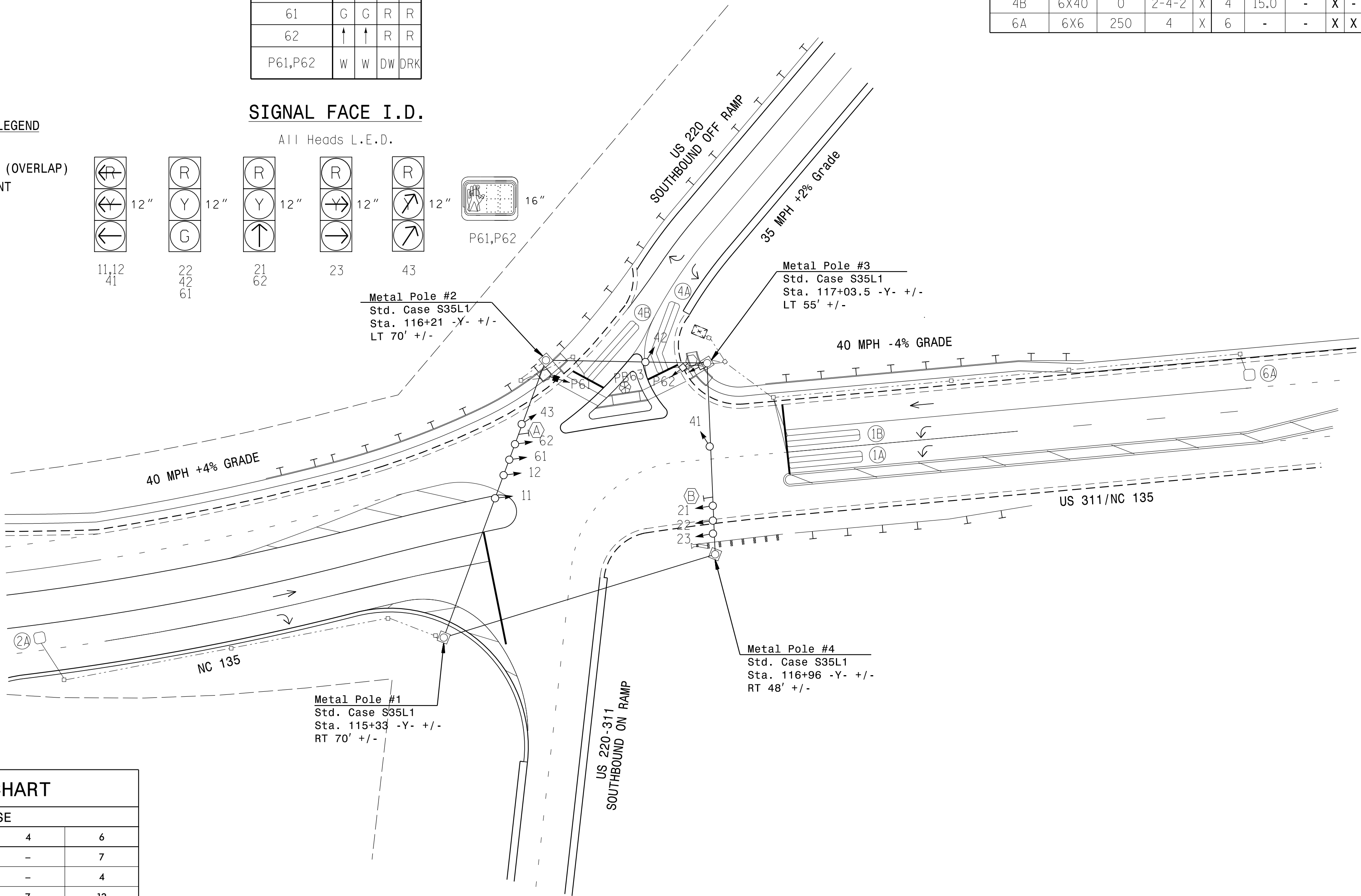
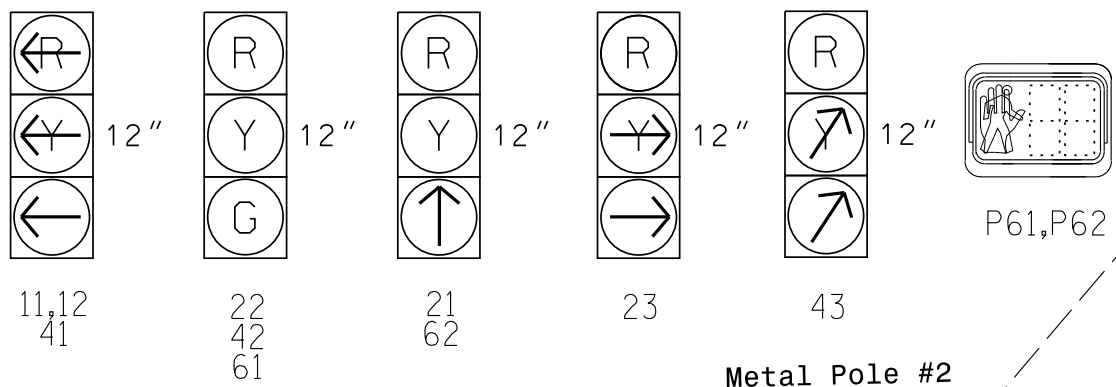
- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 may be lagged.
- Tether signalheads numbered 43 and 62.
- Set all detector units to presence mode.
- Omit "Walk" and flashing "Don't Walk" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signalsystem timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

SIGNAL FACE I.D.

All Heads L.E.D.



MAXTIME TIMING CHART

FEATURE	PHASE			
	1	2	4	6
Walk *	-	-	-	7
Ped Clear	-	-	-	4
Min Green *	7	12	7	12
Passage *	2.0	6.0	2.0	6.0
Max 1 *	20	90	40	90
Yellow Change	3.0	4.1	3.0	4.1
Red Clear	3.9	3.1	2.8	3.1
Added Initial *	-	2.5	-	2.5
Maximum Initial *	-	29	-	29
Time Before Reduction *	-	15	-	15
Time To Reduce *	-	30	-	30
Minimum Gap	-	3.0	-	3.0
Advance Walk	-	-	-	-
Non Lock Detector	X	-	X	-
Vehicle Recall	-	MIN RECALL	-	MIN RECALL
Dual Entry	-	-	-	-

* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

- | PROPOSED | EXISTING |
|--|--|
| Traffic Signal Head Sign | Traffic Signal Head Sign |
| Pedestrian Signal Head With Push Button & Sign | Pedestrian Signal Head With Push Button & Sign |
| Inductive Loop Detector | Inductive Loop Detector |
| Controller & Cabinet Junction Box | Controller & Cabinet Junction Box |
| 2-in Underground Conduit | 2-in Underground Conduit |
| N/A Right of Way | N/A Right of Way |
| Directional Arrow | Directional Arrow |
| N/A Guardrail | N/A Guardrail |
| Type I Pushbutton Post | Type I Pushbutton Post |
| Type II Signal Pedestal | Type II Signal Pedestal |
| Metal Strain Pole | Metal Strain Pole |
| N/A Curb Ramp | N/A Curb Ramp |
| No Right Turn Sign (R3-1) | No Right Turn Sign (R3-1) |
| No U-turn/No Left Turn Sign (R3-18) | No U-turn/No Left Turn Sign (R3-18) |

Signal Upgrade - Final Design

Prepared for the Offices of:

Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section

750 N. Greenfield Pkwy, Garner, NC 27529

US 311/NC 135
at
US 220 Southbound Ramps

Division 7 Rockingham County Mayodan

PLAN DATE: August 2025 REVIEWED BY: _____

PREPARED BY: Golam Moinuddin REVIEWED BY: _____

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA
PROFESSIONAL ENGINEER
SEAL
034454
GOLAM M. MOINUDDIN

Signed by: Golam Moinuddin
8/1/2025
92897C8B27E4EC
SIGNATURE DATE
SIC. INVENTORY NO. 07-1475

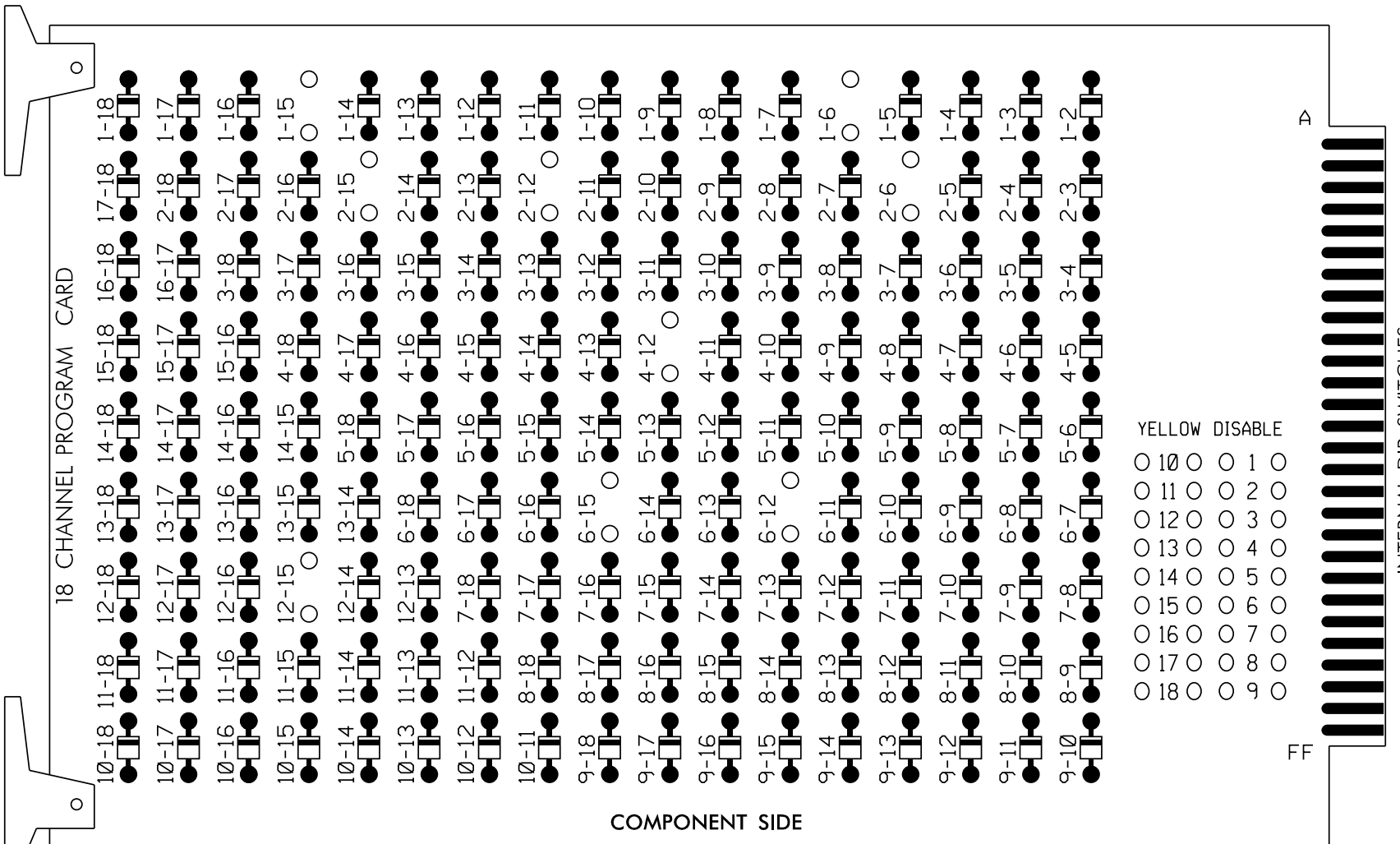
Plans Prepared in the Offices of:



Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27606
License No: C-3097

(remove jumpers and set switches as shown)

ON OFF
WD ENABLE
SW2



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that the Red Enable is active at all times during normal operation.
4. Integrate monitor with Ethernet network in cabinet.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
3. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
4. The cabinet and controller are part of the Signal System #: D07-09_Mayodan

EQUIPMENT INFORMATION

Controller.....	2070LX
Cabinet.....	332 w/ Aux
Software.....	Q-Free MAXTIME
Cabinet Mount.....	Base
Output File Positions.....	18 With Aux. Output File
Load Switches Used.....	S1, S2, S5, S8, S9, AUX S5
Phases Used.....	1, 2, 4, 6
Overlap "1".....	NOT USED
Overlap "2".....	NOT USED
Overlap "3".....	NOT USED
Overlap "4".....	*

*See overlap programming detail

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2		S3	S4	S5			S6	S7	S8		S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4			14		5	6		15	7	8	16	9	10	17	11	12	18
PHASE	1	2		2 PED	3	4			4 PED	5	6		6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	11,12	21	22	NU	NU	41	42	43	NU	NU	61	62	P61, P62	NU	NU	NU	NU	NU	NU	NU	23	NU
RED		128	128				101	101			134	134									A101	
YELLOW		129	129				102				135	135										
GREEN			130				103				136											
RED ARROW	125					101																
YELLOW ARROW	126					102		102													A102	
FLASHING YELLOW ARROW																						
GREEN ARROW	127	130				103		103				136									A103	
													119									
													121									

NU = Not Used

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

INPUT FILE POSITION LAYOUT

(front view)

[illegible]

EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

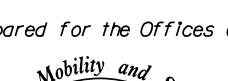
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	TB2-1,2	I1U	56	18	1	1	3.0	-	X	-	X	-
1B	TB2-5,6	I2U	39	1	2	1	-	-	X	-	X	-
2A	TB2-9,10	I3U	63	29	4	2	-	-	X	X	X	-
4A	TB4-9,10	I6U	41	3	8	4	-	-	X	-	X	-
4B	TB4-11,12	I6L	45	7	9	4	15.0	-	X	-	X	-
6A	TB3-5,6	I2U	40	2	16	6	-	-	X	X	X	-
PED PUSH BUTTONS							NOTE: INSTALL DC ISOLATOR IN INPUT FILE SLOT I13.					
P61,P62	TB8-7,9	I13U	68	34	6	PED 6						

INPUT FILE POSITION LEGEND: J2L

FILE J _____
SLOT 2 _____
LOWER _____

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1475
DESIGNED: August 2025
SEALED: 8/1/2025
REVISED: N/A

Signal Upgrade - Final Design
Electrical Detail - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:	US 311/NC 135 at US 220 Southbound Ramps	SEAL 																																	
Prepared for the Offices of: 	<table style="width: 100%;"> <tr> <td style="width: 33%;">Division 7</td> <td style="width: 33%;">Rockingham County</td> <td style="width: 33%;">Waydan</td> </tr> <tr> <td>PLAN DATE: August 2025</td> <td colspan="2">REVIEWED BY:</td> </tr> <tr> <td>PREPARED BY: Golam Moynuddin</td> <td colspan="2">REVIEWED BY:</td> </tr> </table>	Division 7	Rockingham County	Waydan	PLAN DATE: August 2025	REVIEWED BY:		PREPARED BY: Golam Moynuddin	REVIEWED BY:		Signed by:  GOLAM MOYNUDDIN, P.E. 8/1/2025																								
Division 7	Rockingham County	Waydan																																	
PLAN DATE: August 2025	REVIEWED BY:																																		
PREPARED BY: Golam Moynuddin	REVIEWED BY:																																		
750 N. Greenfield Pkwy, Garner, NC 27529	<table style="width: 100%;"> <thead> <tr> <th style="width: 60%;">REVIEWS</th> <th style="width: 20%;">INIT.</th> <th style="width: 20%;">DATE</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	REVIEWS	INIT.	DATE																															SIG. INVENTORY NO. 07-1475
REVIEWS	INIT.	DATE																																	

Front Panel
Main Menu >Controller >Unit

Web Interface
Home > Controller > Unit

Modify parameters as shown below and save changes.

Start Up Parameters

Unit Flash Parameters

All Red Flash Exit Time
6

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface
Home >Controller >Overlap Configuration >Overlaps

In the table view of the web interface, right click on "Overlap" in the top left corner of the table. Copy the entire contents of Overlap Plan 1. Paste Overlap Plan 1 into Overlap Plan 2. Modify Overlap Plan 2 as shown below and save changes.

Overlap Plan 1

Overlap	4
Type	Normal
Included Phases	2,4
Modifier Phases	-
Modifier Overlaps	-
Trail Green	0
Trail Yellow	0.0
Trail Red	0.0

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1475
DESIGNED: August 2025
SEALED: 8/1/2025
REVISED: N/A

Signal Upgrade - Final Design
Electrical Detail - Sheet 2 of 2

**DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED**

Prepared in the Offices of



Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27606
License No: C-3097

**ELECTRICAL AND PROGRAMMING
DETAILS FOR:**

Prepared for the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

US 311/NC 135
at
US 220 Southbound Ramps

Division 7 Rockingham County Mayodan

PLAN DATE: August 2025

PREPARED BY: Golam Moinuddin

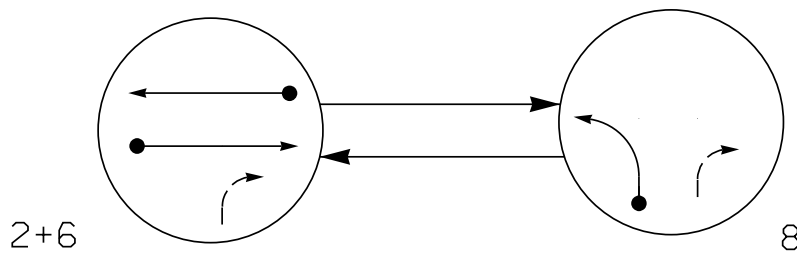
REVISIONS

UNIT.	DATE
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Signed by: Gulam Moinuddin
92897C8B27ED4EC... 8/1/

SIG. INVENTORY NO. 07-1475

PHASING DIAGRAM



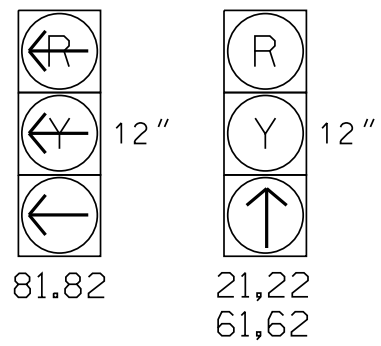
PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT

TABLE OF OPERATION				
SIGNAL FACE	PHASE			FLASH
	2 + 6	8		
21, 22	↑	R	R	
61, 62	↑	R	R	
81, 82	←	←	←	

SIGNAL FACE I.D.

All Heads L.E.D.



MAXTIME DETECTOR INSTALLATION CHART											
DETECTOR						PROGRAMMING					
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	URNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL DURING GREEN	NEW CARD
2A*	6X6	70	*	*	2	-	-	X	-	X	-
6A*	6X6	70	*	*	6	-	-	X	-	X	-
8A*	6X40	0	*	*	8	-	-	X	-	X	-

* Video Detection Zone

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- This intersection uses video detection. Install detectors according to the manufacturers instructions to achieve the desired detection.
- Maximum times shown in timing chart are for free-run opation only. Coordinated signal system timing values supersede these values.
- Install department-furnished cellular modem and antenna for remote communications. Request cell modem from the Engineer at least 8 weeks before anticipated deployment.

LEGEND

PROPOSED	EXISTING

MAXTIME TIMING CHART

FEATURE	PHASE		
	2	6	8
Walk *	-	-	-
Ped Clear	-	-	-
Min Green *	10	10	7
Passage *	3.0	3.0	2.0
Max 1 *	60	60	40
Yellow Change	3.8	3.8	3.0
Red Clear	2.2	2.2	1.6
Added Initial *	-	-	-
Maximum Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Advance Walk	-	-	-
Non Lock Detector	-	-	X
Vehicle Recall	MIN RECALL	MIN RECALL	-
Dual Entry	-	-	-

* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade - Temporary Design 1 (TMP Phase III)

Prepared for the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27529		US 311 /NC 135 at US 220 Northbound Ramps Division 7 Rockingham County Mayodan PLAN DATE: June 2025 REVIEWED BY: Golam Moynuddin PREPARED BY: Jamal Khdeir REVIEWED BY:		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED SEAL NORTH CAROLINA PROFESSIONAL SEAL 034454 ENGINEER GOLAM M. MOYNUDDIN Signed by: Golam Moynuddin 6/27/2025 SIGNATURE DATE SIG. INVENTORY NO. 07-1417 TI	
Plans Prepared in the Offices of: Johnson, Mirmiran, & Thompson Inc. 4700 Falls of Neuse Rd, Suite 100, Raleigh, NC, 27606 License No: C-3097		REVISIONS INIT. DATE			

(remove jumper and set switches as shown)

(remove jumper and set switches as shown)



1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that the Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

(front view)



FS = FLASH SENSE
ST = STOP TIME

Front Panel
Main Menu >Controller >Unit

Web Interface
Home > Controller > Unit

Modify parameters as shown below and save changes.

StartUp Clearance Hold
6

All Red Flash Exit Time
6

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.

2. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
3. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
4. The cabinet and controller are part of the Signal System #: D07-09_Mayodan

```

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S2, S8, S11
Phases Used.....2, 6, 8

```

Overlap "1"	NOT USED
Overlap "2"	NOT USED
Overlap "3"	NOT USED
Overlap "4"	NOT USED

Install a video detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1417 T1
DESIGNED: June 2025
SEALED: 6/27/2025
REVISED: N/A

Prepared in the Offices of



Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27606
License No: C-3097

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	NU	NU	NU	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128						134										
YELLOW		129						135										
GREEN																		
RED ARROW											107							
YELLOW ARROW											108							
FLASHING YELLOW ARROW																		
GREEN ARROW		130						136			109							

NU = Not Used

Front Panel
Main Menu >Controller >More>Channels>Channels Config

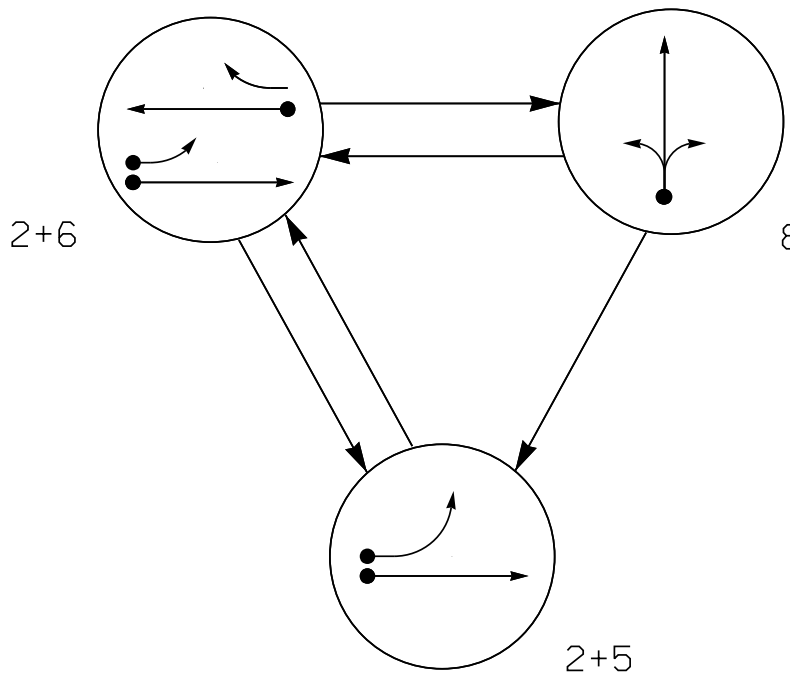
Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

Signal Upgrade - Temp Design 1 (TMP Phase III)
Electrical Detail - Sheet 1 of 1

[illegible]

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

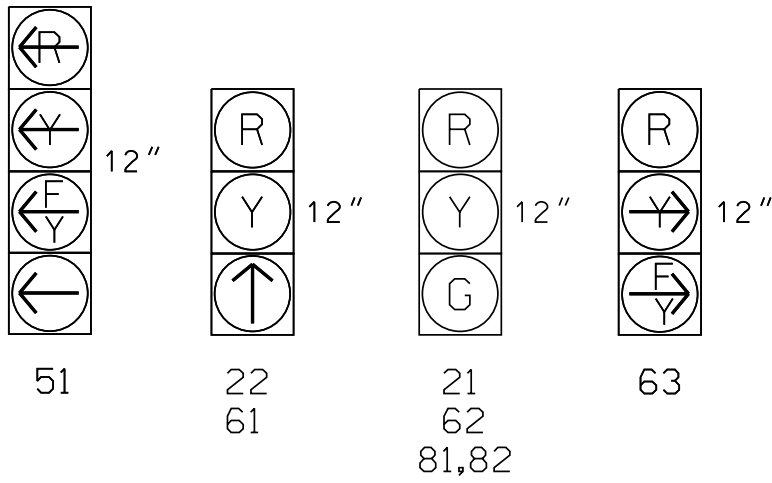
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE			
	2 + 5	2 + 6	8	FLASH
21	G	G	R	R
22	↑	↑	R	R
51	←	←	←	←
61	R	↑	R	R
62	R	G	R	R
63	R	←	←	←
81, 82	R	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



MAXTIME DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING						
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	URNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL CALL	DELAY DURING GREEN	NEW CARD
2A*	6X6	70	*	*	2	-	-	X	-	X	-
5A*	6X40	0	*	*	5	15.0	-	X	-	X	*
6A*	6X6	70	*	*	2	-	-	X	-	X	*
8A*	6X40	0	*	*	8	10.0	-	X	-	X	-

* Video Detection Zone

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 5 may be lagged.
- Reposition existing signalheads numbered 21 and 22.
- Set all detector units to presence mode.
- This intersection uses video detection. Install detectors according to the manufacturers instructions to achieve the desired detection.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

- | PROPOSED | EXISTING |
|---------------------------|-------------------------------------|
| Traffic Signal Head | Modified Signal Head |
| Pedestrian Signal Head | Signal Pole with Sidewalk Guy |
| Signal Pole with Guy | Signal Pole with Sidewalk Guy |
| Inductive Loop Detector | Controller & Cabinet |
| Controller & Cabinet | Junction Box |
| 2-in Underground Conduit | Right of Way |
| Directional Arrow | Non-Intrusive Detection Zone |
| Guardrail | Construction Zone Drums |
| Construction Zone Drums | Construction Zone |
| Construction Zone | Temporary Pavement |
| Temporary Pavement | No Right Turn Sign (R3-1) |
| No Right Turn Sign (R3-1) | No U-Turn/No Left Turn Sign (R3-18) |

MAXTIME TIMING CHART

FEATURE	PHASE			
	2	5	6	8
Walk *	-	-	-	-
Ped Clear	-	-	-	-
Min Green *	10	7	10	7
Passage *	3.0	2.0	3.0	2.0
Max 1 *	60	20	60	40
Yellow Change	3.8	3.0	3.8	3.6
Red Clear	1.2	1.8	1.2	1.7
Added Initial *	-	-	-	-
Maximum Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Advance Walk	-	-	-	-
Non Lock Detector	-	X	-	X
Vehicle Recall	MIN RECALL	-	MIN RECALL	-
Dual Entry	-	-	-	-

* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade - Temporary Design 2 (TMP Phase IV - Step I)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for the Offices of:

Transportation Mobility and Safety Division
DEPARTMENT OF TRANSPORTATION
Signal Design Section

750 N. Greenfield Pkwy, Garner, NC 27529

US 311 /NC 135
at
US 220 Northbound Ramps

Division 7 Rockingham County Mayodan

PLAN DATE: June 2025 REVIEWED BY: Golam Moynuddin

PREPARED BY: Jamal Khdeir REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

PROFESSIONAL ENGINEER

SEAL 034454

ENGINEER

GOLAM MOYNUDDIN

Signed by: Golam Moynuddin

6/27/2025

SIGNATURE DATE

SIG. INVENTORY NO. 07-1417 T2

Plans Prepared in the Offices of:



Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27606
License No: C-3097

MAXTIME STARTUP AND SOFTWARE FLASH
PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters	Unit Flash Parameters
StartUp Clearance Hold	All Red Flash Exit Time
6	6

OUTPUT CHANNEL CONFIGURATION

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

MAXTIME OVERLAP PROGRAMMING DETAIL
FOR DEFAULT PHASING

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	3
Type	FYA 4- Section	FYA 4 - Section
Included Phases	6	6
Modifier Phases		5
Modifier Overlaps	-	-
Trail Green	0	0
Trail Yellow	0.0	0.0
Trail Red	0.0	0.0

FLASHER CIRCUIT MODIFICATION DETAIL

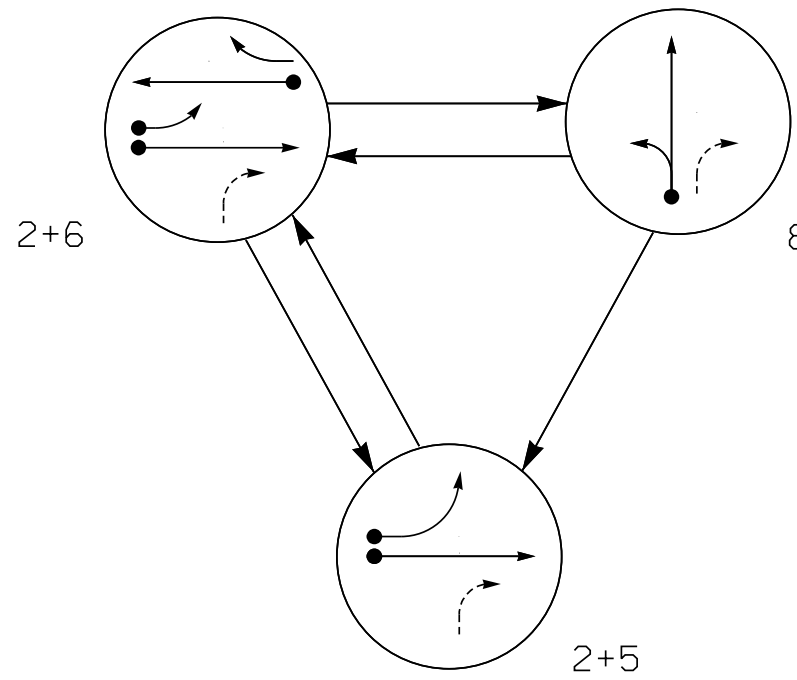
IN ORDER TO INSURE THAT SIGNALS FLASH CONCURRENTLY ON THE
SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

- ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
- ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
- REMOVE FLASHER UNIT 2.

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1417 T2
DESIGNED: June 2025
SEALED: 6/27/2025
REVISED: N/A

Signal Upgrade - Temp Design 2 (TMP Phase IV - Step 1)
Electrical Detail - Sheet 2 of 2



PHASING DIAGRAM DETECTION LEGEND

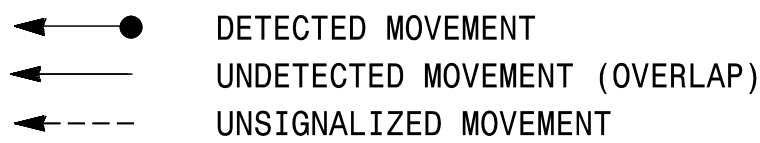
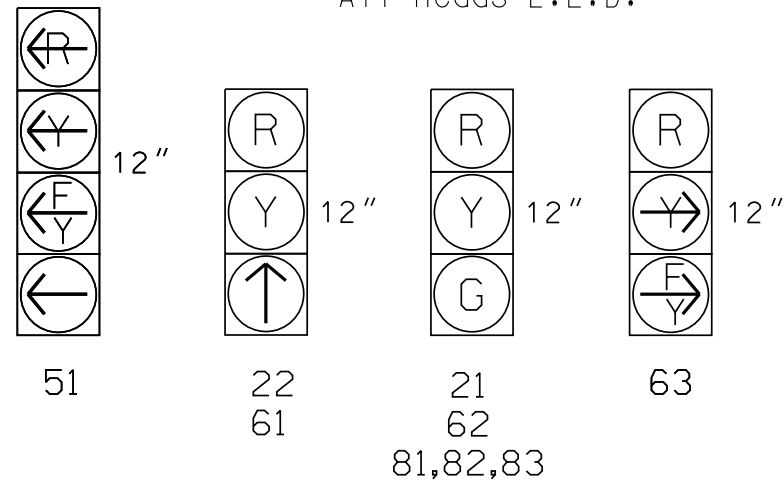


TABLE OF OPERATION

SIGNAL FACE	PHASE			
	2 + 5	2 + 6	8	F A S H
21	G	G	R	R
22	↑	↑	R	R
51	←	↘	↘	←
61		↑	R	R
62	R	G	R	R
63	R	↘	R	R
81, 82, 83	R	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



MAXTIME DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
2A*	6X6	70	*	*	2	-	-	X	-	X	-	-
5A*	6X40	0	*	*	5	15.0	-	X	-	X	-	-
					2	-	-	X	-	X	-	-
6A*	6X6	70	*	-	6	-	-	X	-	X	-	-
8A*	6X40	0	*	-	8	-	-	X	-	X	-	-

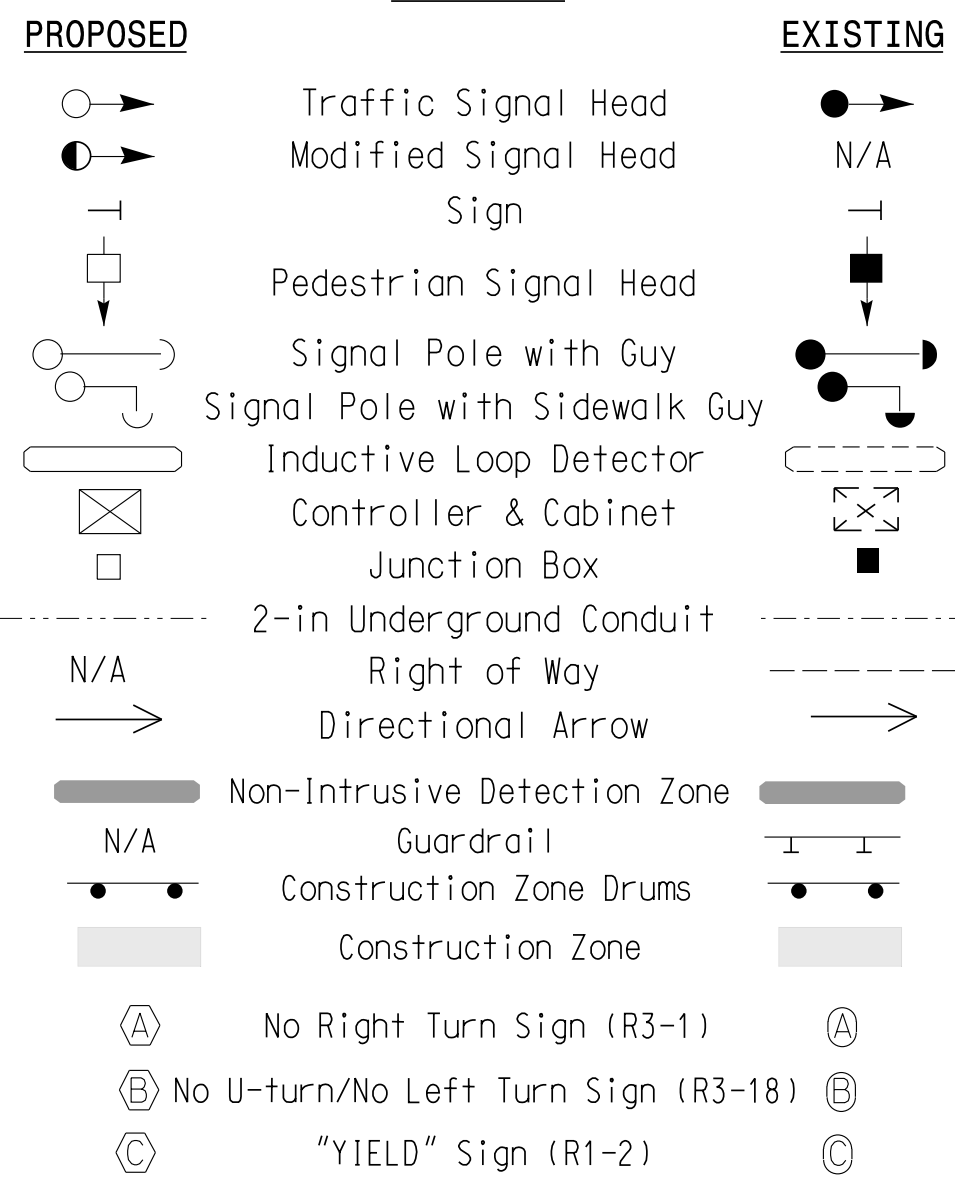
* Video Detection Zone

3 Phase
Fully Actuated
(NC 135 CLS)
Signal System #: D07-09_Mayodan

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Reposition existing signalheads numbered 61,62,63,81 and 82.
5. Set all detector units to presence mode.
6. This intersection uses video detection. Install detectors according to the manufacturers instructions to achieve the desired detection.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

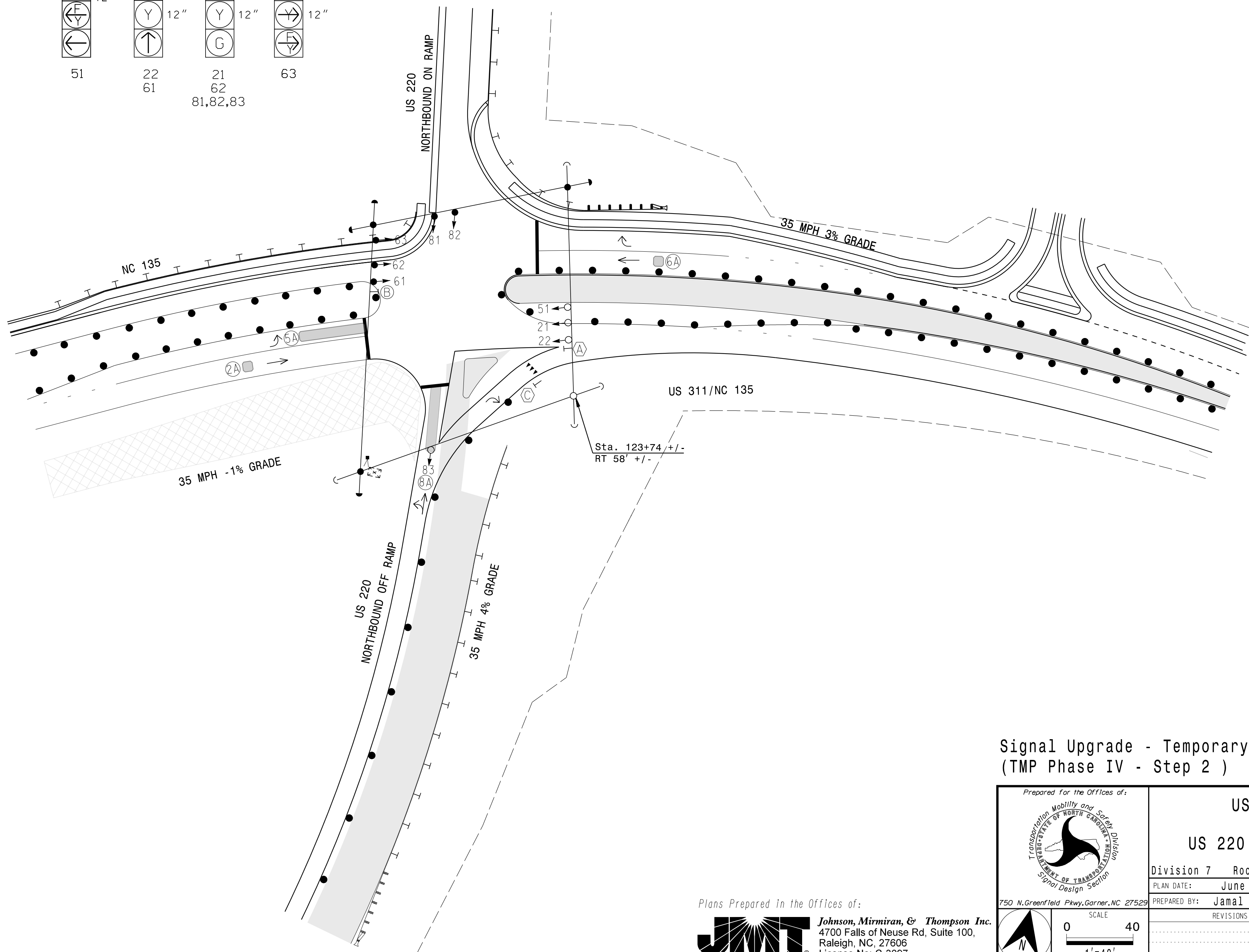
LEGEND



MAXTIME TIMING CHART

FEATURE	PHASE			
	2	5	6	8
Walk *	—	—	—	—
Ped Clear	—	—	—	—
Min Green *	10	7	10	7
Passage *	3.0	2.0	3.0	2.0
Max l *	60	20	60	40
Yellow Change	3.8	3.0	3.8	3.6
Red Clear	2.4	2.8	2.4	2.0
Added Initial *	—	—	—	—
Maximum Initial *	—	—	—	—
Time Before Reduction *	—	—	—	—
Time To Reduce *	—	—	—	—
Minimum Gap	—	—	—	—
Advance Walk	—	—	—	—
Non Lock Detector	—	X	—	X
Vehicle Recall	MIN RECALL	—	MIN RECALL	—
Dual Entry	—	—	—	—

* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.



Signal Upgrade - Temporary Design 3
(TMP Phase IV - Step 2)

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

SEAL



Signed by: Gdam Moinuddin 6/27/2023
92887C8B27ED4EC
SIGNATURE DATE
SIG. INVENTORY NO. 07-1417 T3

Plans Prepared in the Offices of:



Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27606
License No: C-3097



SCALE

0 40

1" = 40'

US 311 /NC 135
at
US 220 Northbound Ramps

Division 7 Rockingham County Mayodan

PLAN DATE: June 2025	REVIEWED BY: Golam Moinuddin
----------------------	------------------------------

PREPARED BY: Jamal Khdeir	REVIEWED BY: _____
---------------------------	--------------------

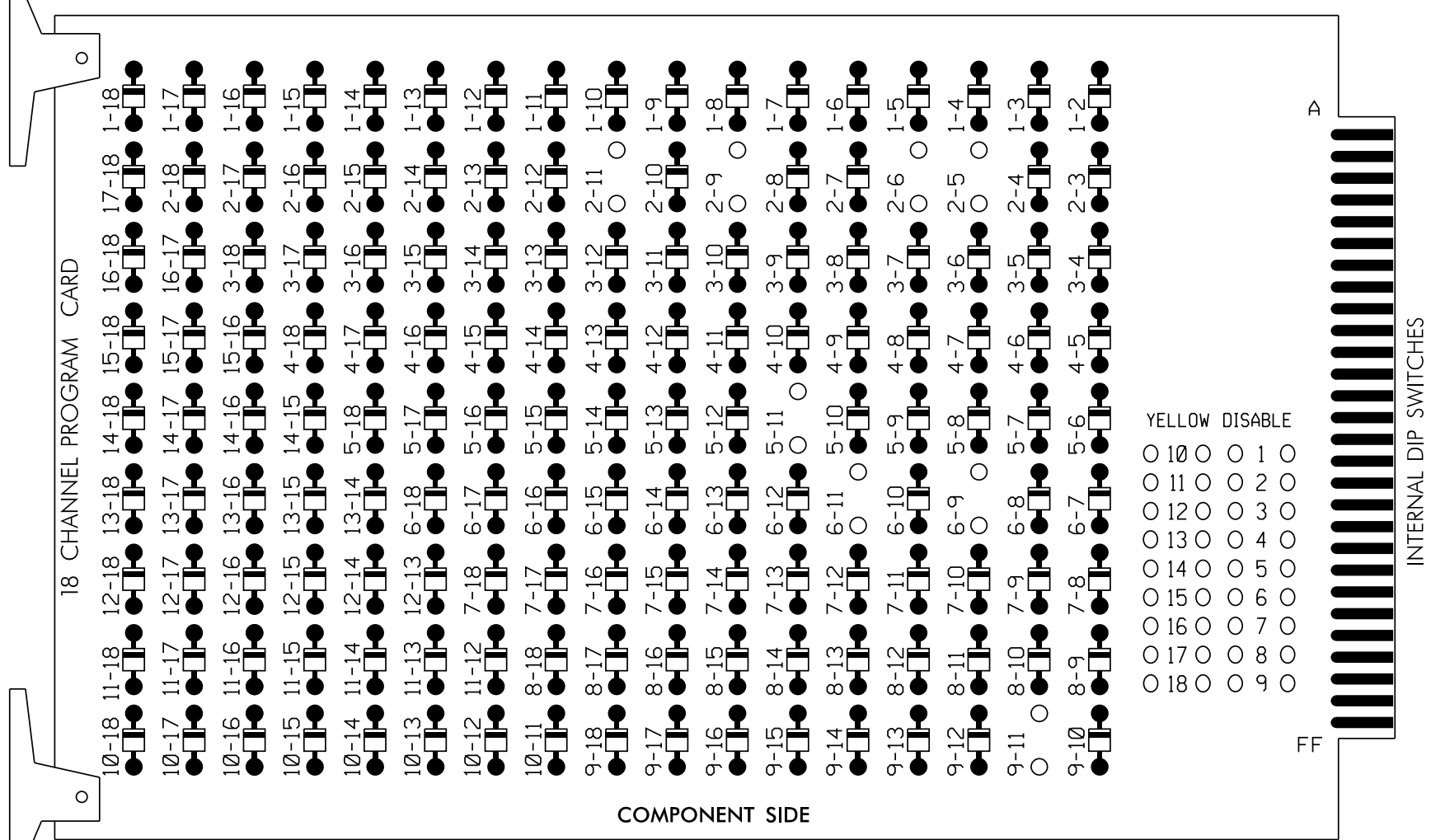
REVISIONS	INIT.	DATE

[illegible]

18 CHANNEL IP CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-5, 2-6, 2-9, 2-11, 5-11, 6-9, 6-11, and 9-11.



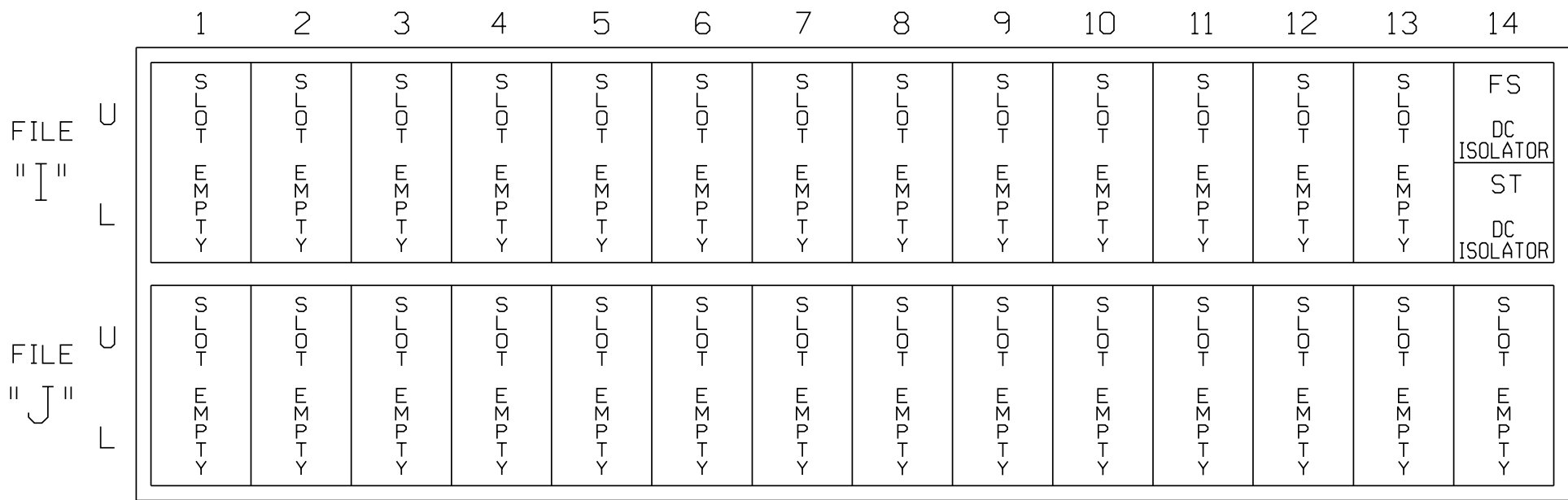
REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that the Red Enable is active at all times during normal operation.
- Integrate monitor with Ethernet network in cabinet.

INPUT FILE POSITION LAYOUT

(front view)



EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
- Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- The cabinet and controller are part of the Signal System #: D07-09_Mayodan

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S2, S7, S8, S11, AUX S1, AUX S4
Phases Used.....2, 5, 6, 8
Overlap "1".....*
Overlap "2".....NOT USED
Overlap "3".....*
Overlap "4".....NOT USED

*See overlap programming detail

SPECIAL DETECTOR NOTE

Install a video detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

PROJECT REFERENCE NO.	SHEET NO.
I-5898	Sig 14.1

SIGNAL HEAD HOOK-UP CHART

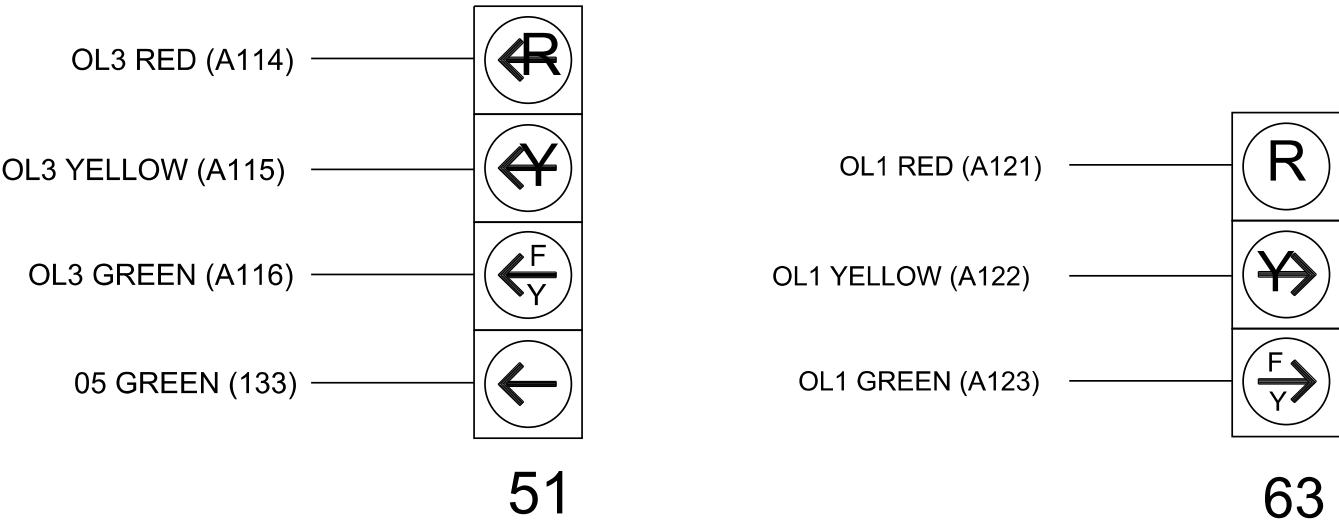
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	21	22	NU	NU	NU	51	61	62	NU	NU	81, 82, 83	NU	63	NU	NU	51	NU
RED		128	128					134	134			107		A121				
YELLOW		129	129				*	135	135			108						
GREEN		130							136			109						
RED ARROW																A114		
YELLOW ARROW													A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW			130				133	136										

NU = Not Used

- * Denotes install load resistor. See load resistor installation detail this sheet.
- * See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)

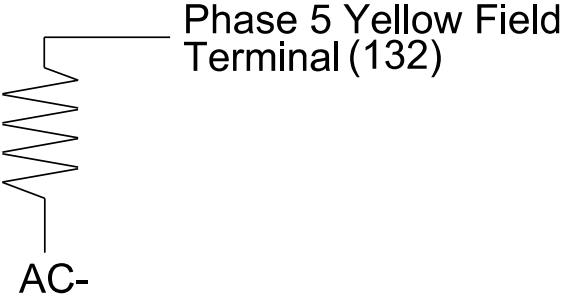


THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1417 T3
DESIGNED: June 2025
SEALED: 6/27/2025
REVISED: N/A

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

ACCEPTABLE VALUES	
Value (ohms)	Wattage
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



Signal Upgrade -- Temp Design 3 (IMP Phase IV -- Step 2) --
Electrical Detail -- Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:		US 311/NC 135 at US 220 Northbound Ramps		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared for the Offices of:		Division 7 Rockingham County Wayodan		SEAL NORTH CAROLINA PROFESSIONAL SEAL 034454 ENGINEER GOLAM MOINUDDIN	
PLAN DATE: June 2025		REVIEWED BY: _____		Signed by: <i>Golam Moinuddin</i> 6/27/2025 DATE	
PREPARED BY: Golam Moinuddin		REVIEWED BY: _____		SIGNED BY: _____ DATE	
REVISIONS		INIT.		DATE	
750 N. Greenfield Pkwy, Garner, NC 27529					
Prepared in the Offices of:		Johnson, Mirmiran, & Thompson Inc.		SIGNED BY: _____ DATE	
4700 Falls of Neuse Rd, Suite 100, Raleigh, NC, 27606 License No: C-3097				SIGNED BY: _____ DATE	

MAXTIME STARTUP AND SOFTWARE FLASH PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters	Unit Flash Parameters
StartUp Clearance Hold	All Red Flash Exit Time
6	6

OUTPUT CHANNEL CONFIGURATION

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	3
Type	FYA 4- Section	FYA 4 - Section
Included Phases	6	6
Modifier Phases	-	5
Modifier Overlaps	-	-
Trail Green	0	0
Trail Yellow	0.0	0.0
Trail Red	0.0	0.0

FLASHER CIRCUIT MODIFICATION DETAIL

IN ORDER TO INSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

1. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
2. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
3. REMOVE FLASHER UNIT 2.

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

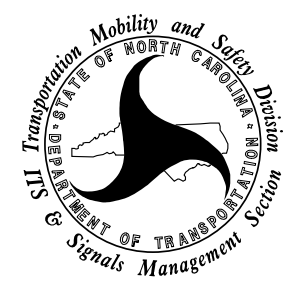
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1417 T3
DESIGNED: June 2025
SEALED: 6/27/2025
REVISED: N/A

Prepared in the Offices of:
JMPT Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27606
License No: C-3097

Signal Upgrade - Temp Design 3 (IMP Phase IV - Step 2) -
Electrical Detail - Sheet 2 of 2

Electrical and Programming Details For:

Prepared for the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

US 311/NC 135
at
US 220 Northbound Ramps

Division 7Rockingham CountyWayodan

PLAN DATE: June 2025REVIEWED BY:

PREPARED BY: Golam MoinuddinREVIEWED BY:

REVISIONSINIT. DATE

Signed by:

DATE: 6/27/2025

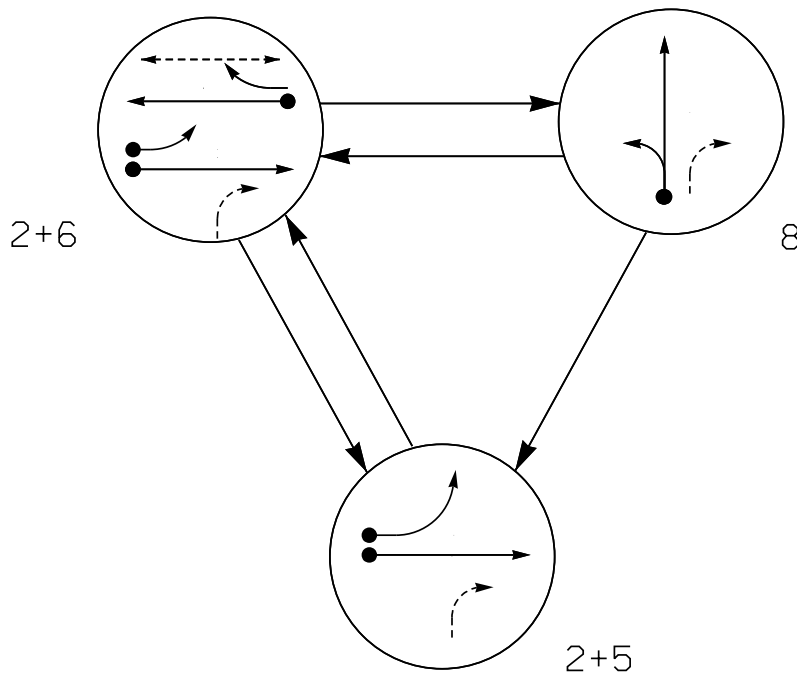
Sig. Inventory No. 07-1417 T3

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SEAL



PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

SIGNAL FACE	PHASE			
	2 + 5	2 + 6	8	FLASH
21	G	G	R	R
22	↑	↑	R	R
51	←	←	←	←
61	R	↑	R	R
62	R	G	R	R
63	R	←	R	R
81, 82, 83	R	R	G	R
P61, P62	DW	W	DW	DRK

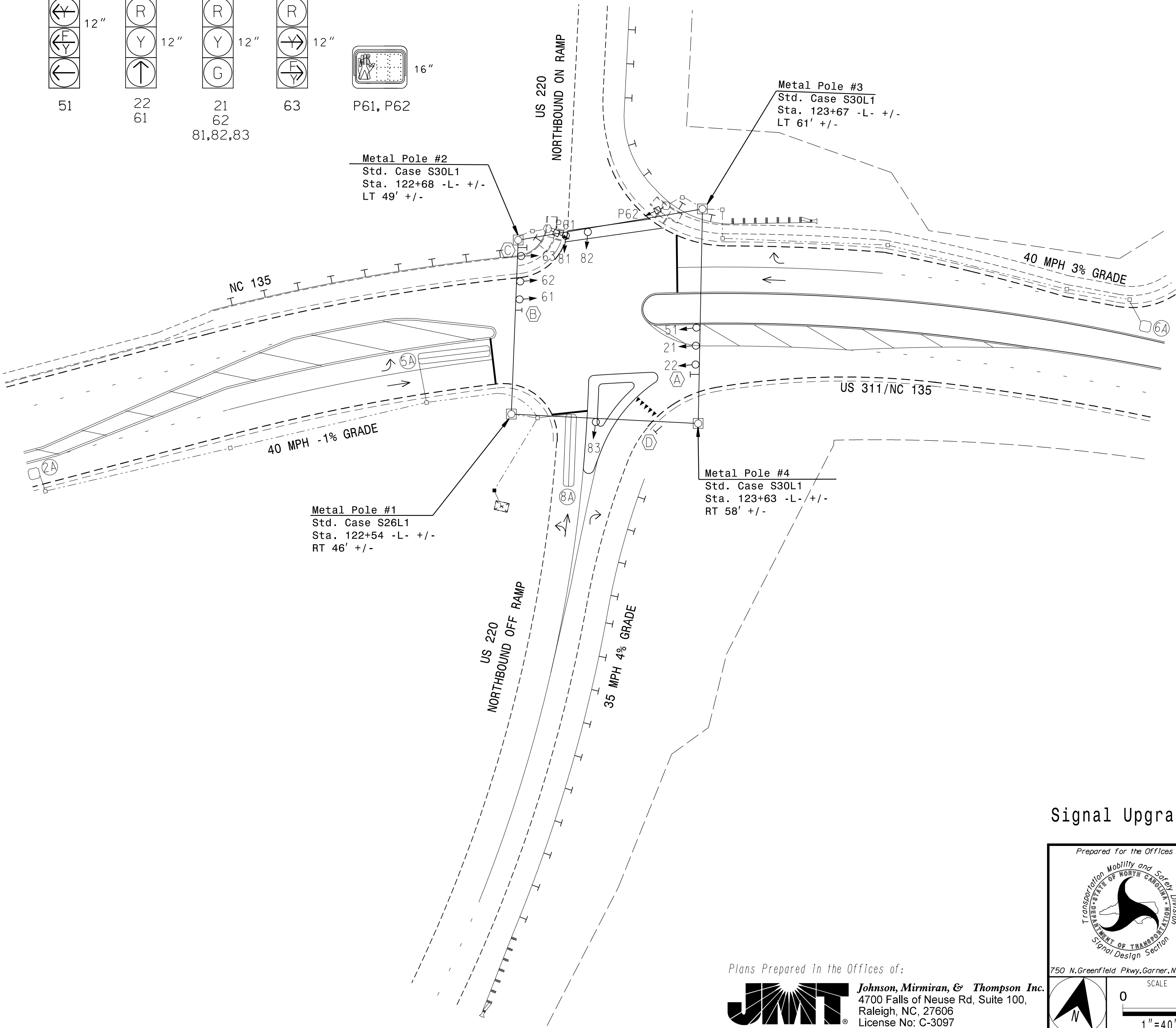
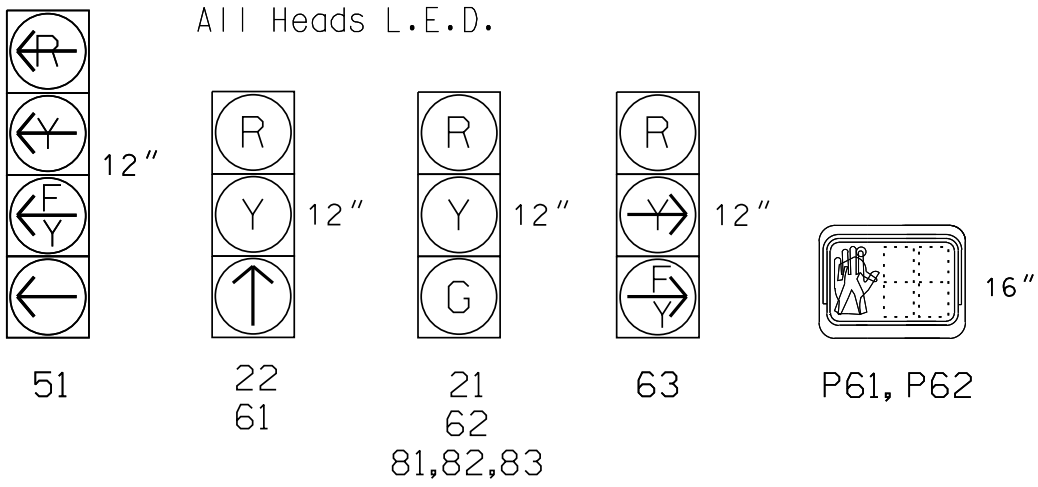
MAXTIME DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
2A	6X6	250	5	X	2	-	-	X	X	X	-
5A	6X40	0	2-4-2	X	5	15.0	-	X	-	X	-
6A	6X6	250	6	X	6	-	-	X	X	X	-
8A	6X40	0	2-4-2	X	8	-	-	X	-	X	-

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 5 may be lagged.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Dont Walk" time only.
- To provide a leading pedestrian interval phase 6, program FYA heads numbered 51 and 63 to delay for 7 seconds after the start of the phase 6 walk interval. See Electrical Details for programming.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

SIGNAL FACE I.D.



LEGEND

- | PROPOSED | EXISTING |
|-------------------------------------|----------|
| Traffic Signal Head | N/A |
| Modified Signal Head | N/A |
| Sign | N/A |
| Pedestrian Signal Head | N/A |
| Signal Pole with Guy | N/A |
| Signal Pole with Sidewalk Guy | N/A |
| Inductive Loop Detector | N/A |
| Controller & Cabinet | N/A |
| Junction Box | N/A |
| 2-in Underground Conduit | N/A |
| Right of Way | N/A |
| Directional Arrow | N/A |
| Guardrail | N/A |
| Metal Strain Pole | N/A |
| Type II Signal Pedestal | N/A |
| Curb Ramp | N/A |
| No Right Turn Sign (R3-1) | N/A |
| No U-Turn/No Left Turn Sign (R3-18) | N/A |
| "RIGHT TURN SIGNAL" Sign (R10-10R) | N/A |
| "YIELD" Sign (R1-2) | N/A |

MAXTIME TIMING CHART

FEATURE	PHASE			
	2	5	6	8
Walk *	-	-	14	-
Ped Clear	-	-	11	-
Min Green *	12	7	12	7
Passage *	6.0	2.0	6.0	2.0
Max 1 *	90	20	90	40
Yellow Change	4.1	3.0	4.1	3.6
Red Clear	1.9	2.8	1.9	2.0
Added Initial *	2.5	-	2.5	-
Maximum Initial *	30	-	30	-
Time Before Reduction *	15	-	15	-
Time To Reduce *	30	-	30	-
Minimum Gap	3.0	-	3.0	-
Advance Walk	-	-	**	-
Non Lock Detector	-	X	-	X
Vehicle Recall	MIN RECALL	-	MIN RECALL	-
Dual Entry	-	-	-	-

* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

* See Note 7.

Signal Upgrade - Final Design

Prepared for the Offices of:

Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section

750 N. Greenfield Pkwy, Garner, NC 27529

US 311 /NC 135
at
US 220 Northbound Ramps

Division 7 Rockingham County Mayodan

PLAN DATE: June 2025 REVIEWED BY: Golam Moynuddin

PREPARED BY: Jamal Khdeir REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

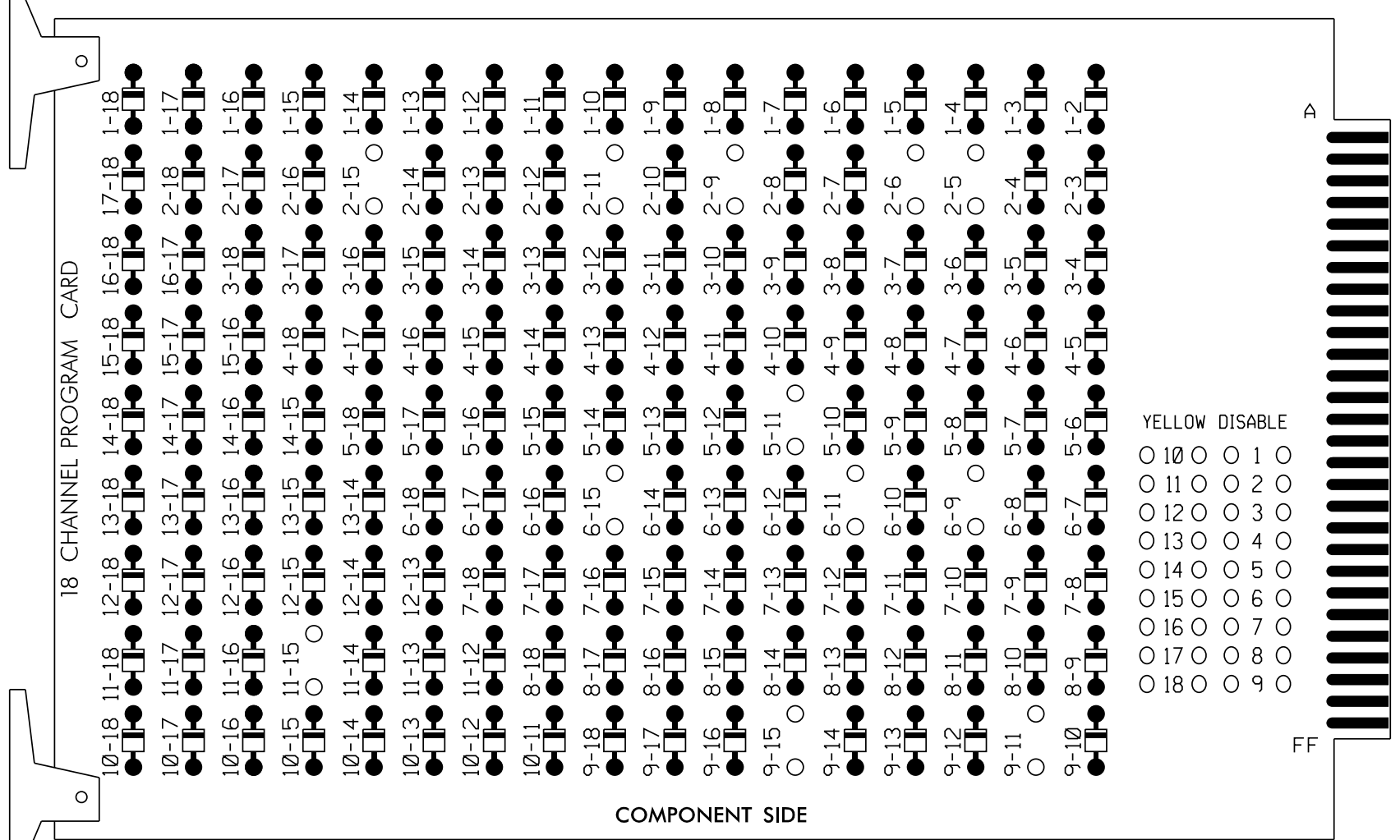
SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 034454
GOLAM MOYNUDDIN

Signed by: Golam Moynuddin
6/27/2025
SIGNATURE DATE
SIC. INVENTORY NO. 07-1417

18 CHANNEL IP CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-5, 2-6, 2-9, 2-11, 2-15, 5-11, 6-9, 6-11, 6-15, 9-11, 9-15, and 11-15.



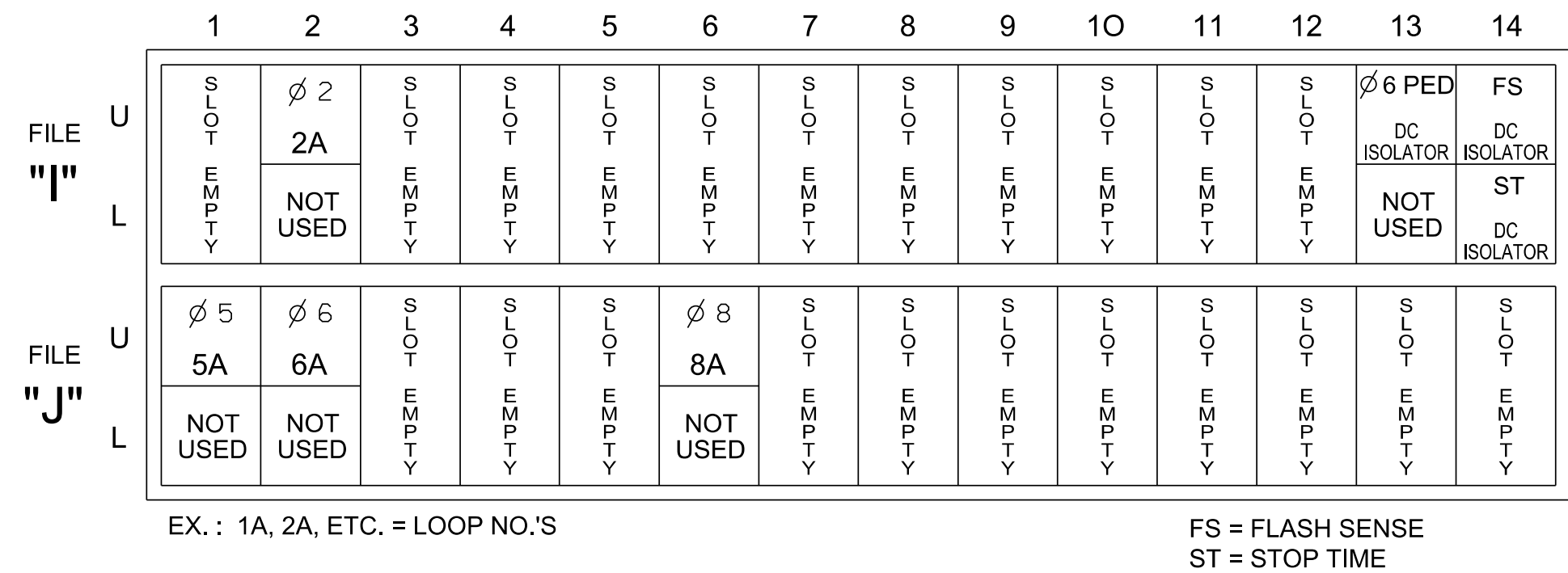
REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that the Red Enable is active at all times during normal operation.
- Integrate monitor with Ethernet network in cabinet.

INPUT FILE POSITION LAYOUT

(front view)

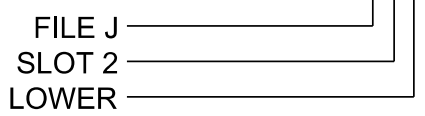


INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
2A	TB2-5,6	I2U	39	1	2	2	-	-	X	X	X	-
5A	TB3-1,2	J1U	55	17	15	5	15	-	X	-	X	-
6A	TB3-5,6	J2U	40	2	16	6	-	-	X	X	X	-
8A	TB5-9,10	J6U	42	4	22	8	-	-	X	-	X	-
PED PUSH BUTTONS												
P61,P62	TB8-7,9	I13U	68	34	6	PED 6						

*System detector only. Remove any assigned vehicle phase.

INPUT FILE POSITION LEGEND: J2L



NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
- Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- The cabinet and controller are part of the Signal System #: D07-09_Mayodan

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S2, S7, S8, S9, S11, AUX S1, AUX S4

Phases Used.....2, 5, 6, 6PED, 8
Overlap "1".....*
Overlap "2".....NOT USED
Overlap "3".....*
Overlap "4".....NOT USED

*See overlap programming detail on sheet 2

MAXTIME STARTUP AND SOFTWARE FLASH
PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

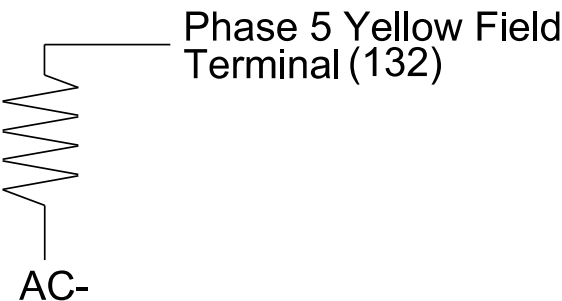
Unit Flash Parameters

All Red Flash Exit Time
6

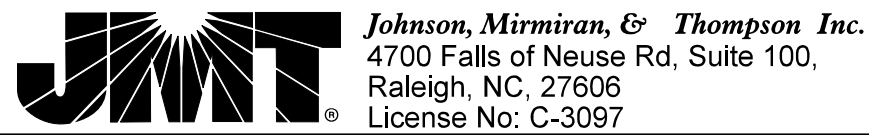
LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

ACCEPTABLE VALUES	
Value (ohms)	Wattage
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



Prepared in the Offices of:



SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	21	22	NU	NU	NU	51	61	62	P61, P62	NU	81, 82, 83	NU	63	NU	51	NU	NU
RED		128	128					134	134			107	A121					
YELLOW		129	129				*	135	135			108						
GREEN		130							136			109						
RED ARROW																A114		
YELLOW ARROW													A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW			130				133	136										
Hand icon										119								
Ped icon										121								

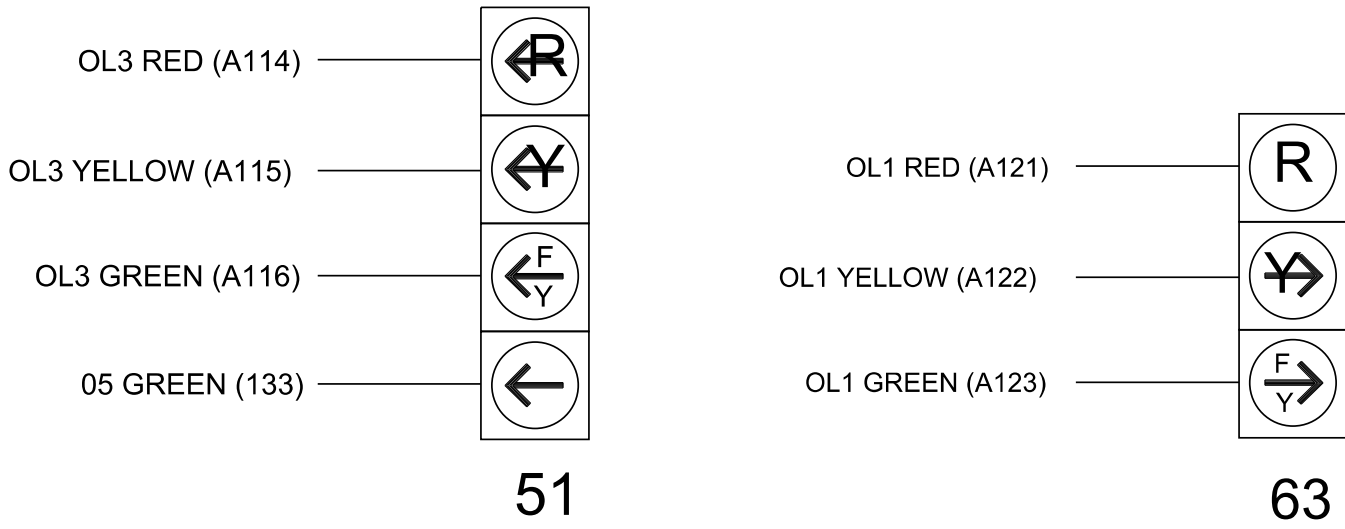
NU = Not Used

* Denotes install load resistor. See load resistor installation detail this sheet.

*See pictorial of head wiring in detail this sheet.

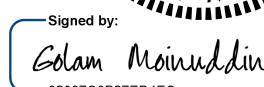
FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1417
DESIGNED: June 2025
SEALED: 6/27/2025
REVISED: N/A

Signal Upgrade - Final Design
Electrical Detail - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529		US 311/NC 135 at US 220 Northbound Ramps	
Division 7 PLAN DATE: June 2025 PREPARED BY: Golam Moinuddin		Rockingham County Wayodan REVIEWED BY: _____ REVISIONS INIT. DATE	
		Signed by:  6/27/2025 DATE SIG. INVENTORY NO. 07-1417	

Overlap	1	3
Type	FYA 4- Section	FYA 4 - Section
Included Phases	6	6
Modifier Phases	-	5
Modifier Overlaps	-	-
Trail Green	0	0
Trail Yellow	0.0	0.0
Trail Red	0.0	0.0
FYA Ped Delay	7.0	7.0

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

StartUp Clearance Hold
6

All Red Flash Exit Time
6

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

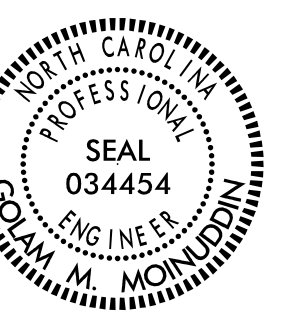
Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1417
DESIGNED: June 2025
SEALED: 6/27/2025
REVISED: N/A

Signal Upgrade - Final Design
Electrical Detail - Sheet 2 of 2

**DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED**

AL



ed by: M Moinuddin 6/27/2025
TC6827ED4EC

IG. INVENTORY NO. 07-1417

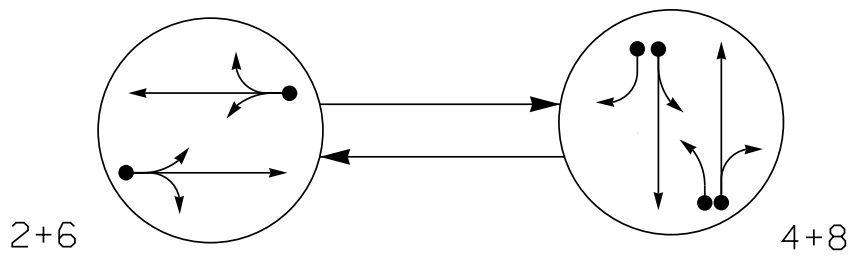
Prepared in the Offices of:



Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27606
License No: C-3097

750 N.Greenfield Pkwy,Garner,NC 27529

PHASING DIAGRAM



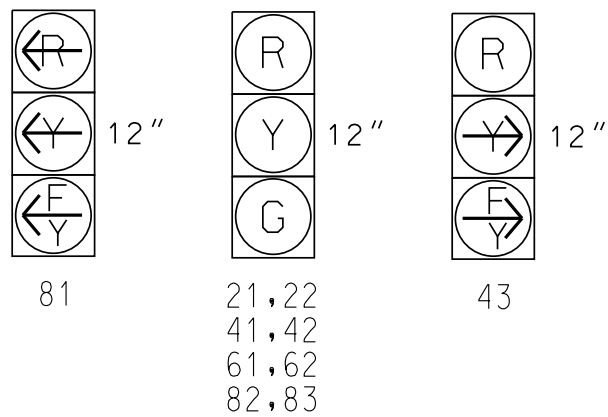
PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT

SIGNAL FACE	PHASE		
	2 + 6	4 + 8	FLASH
21, 22	G	R	R
41, 42	R	G	R
43	R	F	R
61, 62	G	R	R
81	R	F	R
82, 83	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



MAXTIME DETECTOR INSTALLATION CHART											
DETECTOR					PROGRAMMING						
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
2A*	6X6	70	*	*	2	-	-	X	-	X	-
4A*	6X40	0	*	*	4	3.0	-	X	-	X	-
4B*	6X40	0	*	*	4	15.0	-	X	-	X	-
6A*	6X6	70	*	*	6	-	-	X	-	X	-
8A*	6X40	0	*	*	8	3.0	-	X	-	X	-
8B*	6X40	0	*	*	8	10.0	-	X	-	X	-

* Video Detection Zone

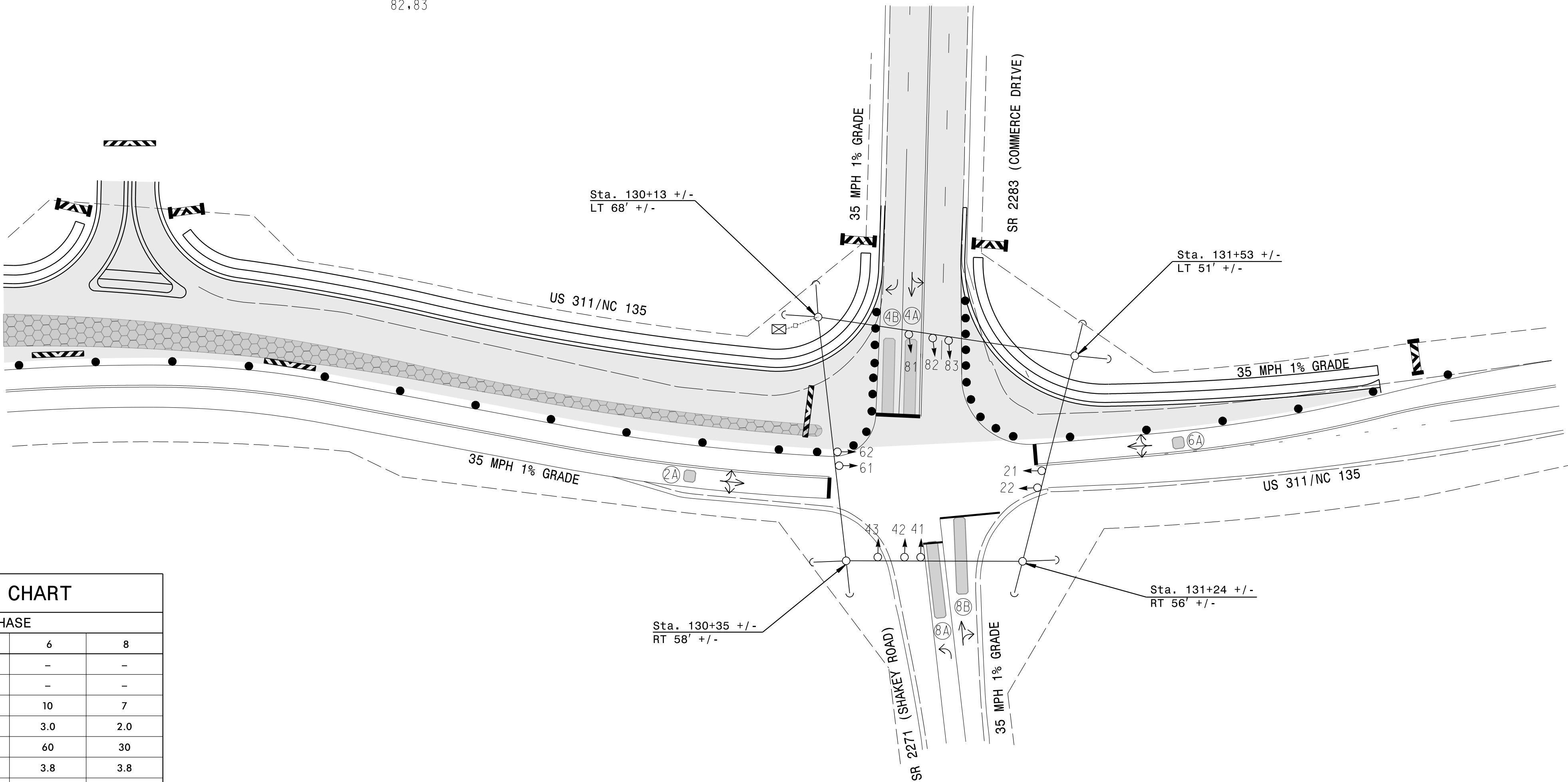
2 Phase
Fully Actuated
(NC 135 CLS)
Signal System #: D07-09_Mayodan

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set alldetector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- This intersection uses video detections. Install detectors according to the manufacturer's instruction to achieve the desired detection.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Install department-furnished cellular modem and antenna for remote communications. Request cell modem from the Engineer at least 8 weeks before anticipated deployment.

MAXTIME TIMING CHART				
FEATURE	PHASE			
	2	4	6	8
Walk *	-	-	-	-
Ped Clear	-	-	-	-
Min Green *	10	7	10	7
Passage *	3.0	2.0	3.0	2.0
Max I *	60	30	60	30
Yellow Change	3.8	3.8	3.8	3.8
Red Clear	1.8	1.0	1.8	1.0
Added Initial *	-	-	-	-
Maximum Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Advance Walk	-	-	-	-
Non Lock Detector	-	X	-	X
Vehicle Recall	MIN RECALL	-	MIN RECALL	-
Dual Entry	-	X	-	X

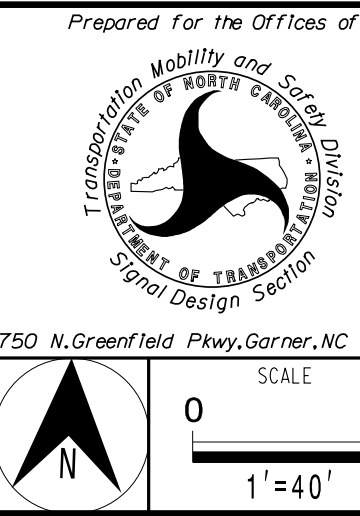
* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.



PROPOSED		EXISTING	
	Traffic Signal Head		N/A
	Modified Signal Head		N/A
	Sign		N/A
	Pedestrian Signal Head		N/A
	Signal Pole with Guy		N/A
	Signal Pole with Sidewalk Guy		N/A
	Inductive Loop Detector		N/A
	Controller & Cabinet		N/A
	Junction Box		N/A
	2-in Underground Conduit		N/A
	Right of Way		N/A
	Directional Arrow		N/A
	Non-Intrusive Detection Zone		N/A
	Construction Zone Drums		N/A
	Construction Zone		N/A
	Temporary Pavement		N/A

Signal Upgrade - Temporary Design 1
(TMP Phase III)

Prepared for the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

US 311 / NC 135
at
SR 2271 (Shakey Road) and
SR 2283 (Commerce Drive)
Division 7 Rockingham County Mayodan

PLAN DATE: June 2025 REVIEWED BY: Golam Moynuddin

PREPARED BY: Jamal Khdeir REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

SEAL



Signed by: 
6/27/2025
DATE

SIG. INVENTORY NO. 07-2075 T1

Plans Prepared in the Offices of:



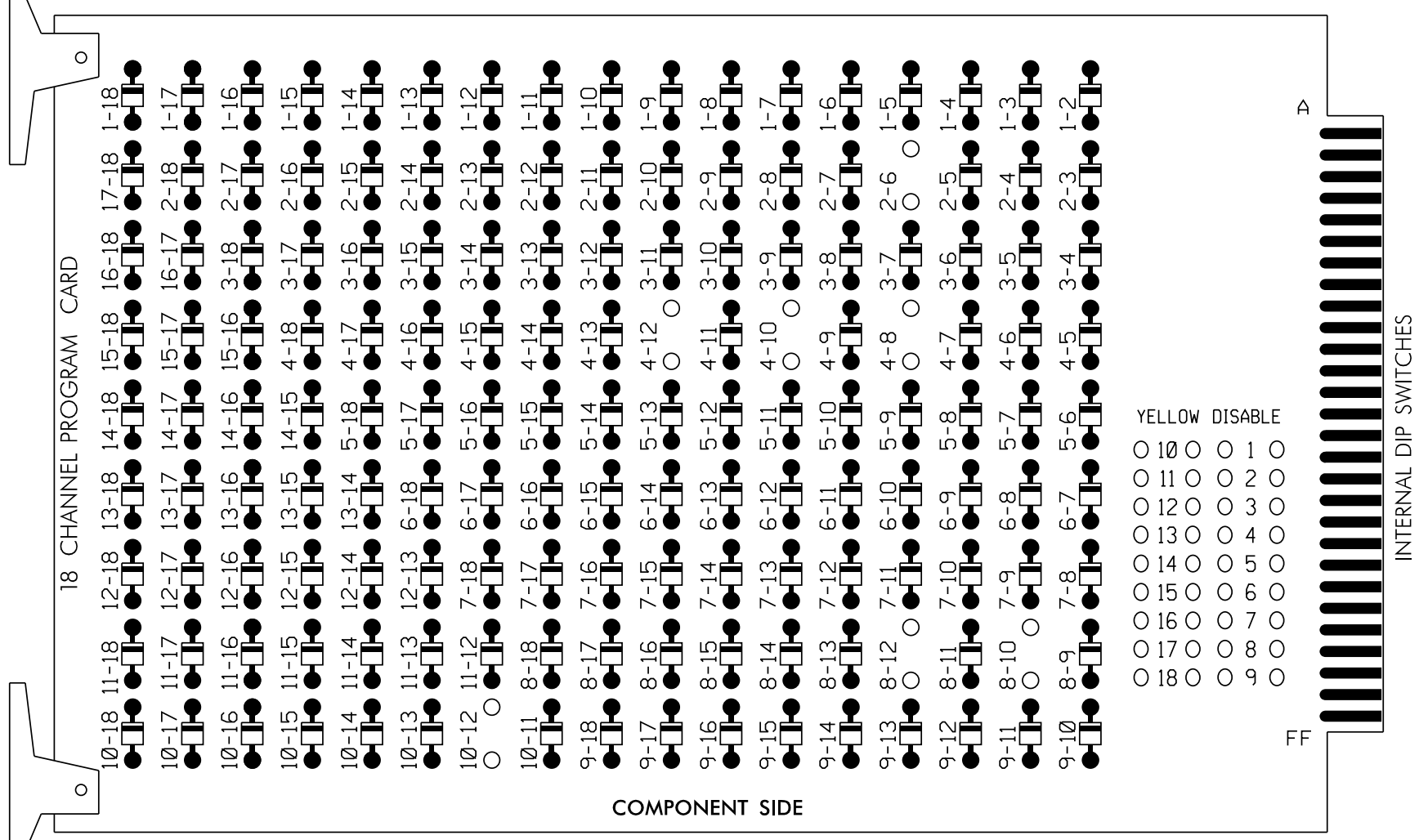
JMT

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Raleigh, NC, 27606
License No: C-3097

18 CHANNEL IP CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-6, 4-8, 4-10, 4-12, 8-10, 8-12 and 10-12.



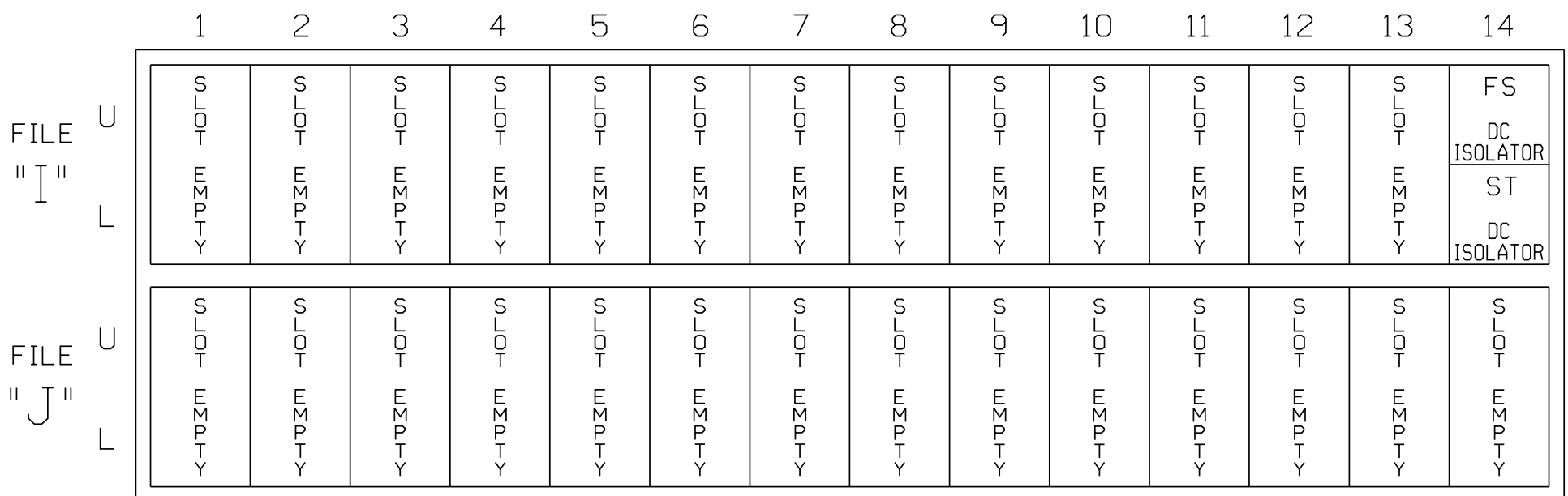
REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that the Red Enable is active at all times during normal operation.
- Integrate monitor with Ethernet network in cabinet.

INPUT FILE POSITION LAYOUT

(front view)



EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

MAXTIME OVERLAP PROGRAMMING DETAIL
FOR DEFAULT PHASING

Front Panel

Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface

Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	2	4
Type	FYA 4 - Section	FYA 4- Section
Included Phases	4	4
Modifier Phases	-	-
Modifier Overlaps	-	-
Trail Green	0	0
Trail Yellow	0.0	0.0
Trail Red	0.0	0.0

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.

2. Program phases 4 and 8 for Dual Entry.

3. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.

4. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.

5. The cabinet and controller are part of the Signal System #: D07-09_Mayodan

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S2, S5, S8, S11, AUX S2, AUX S5
Phases Used.....2, 4, 6, 8
Overlap "1".....NOT USED
Overlap "2".....*
Overlap "3".....NOT USED
Overlap "4".....*

*See overlap programming detail

MAXTIME STARTUP AND SOFTWARE FLASH
PROGRAMMING DETAIL

Front Panel

Main Menu >Controller >Unit

Web Interface

Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

SPECIAL DETECTOR NOTE

Install a video detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

PROJECT REFERENCE NO.	SHEET NO.
I-5898	Sig 16.1

SIGNAL HEAD HOOK-UP CHART

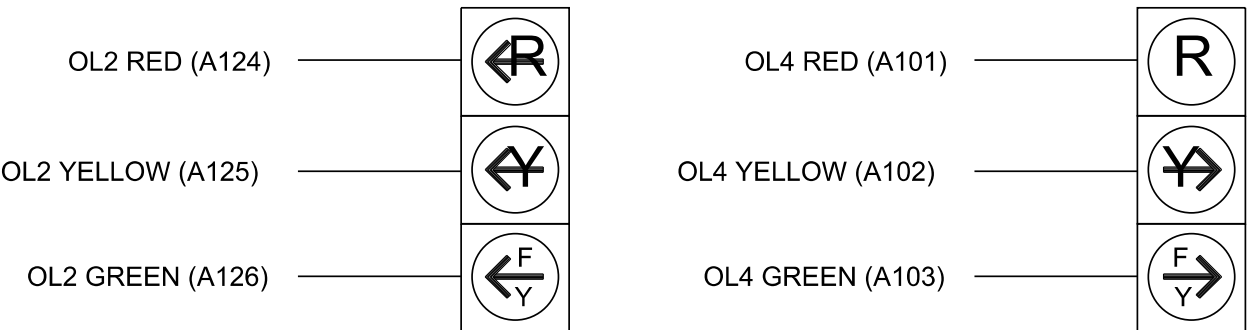
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	82,83	NU	NU	81	NU	NU	43	NU
RED		128			101			134			107						A101	
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW														A124				
YELLOW ARROW														A125			A102	
FLASHING YELLOW ARROW														A126			A103	
GREEN ARROW																		

NU = Not Used

*See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)

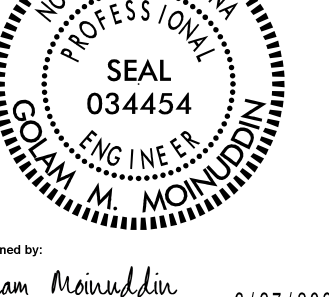


81

43

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-2075 T1
DESIGNED: June 2025
SEALED: 6/27/2025
REVISED: N/A

Signal Upgrade - Temporary Design 1 (TMP Phase II)
Electrical Detail - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529		SEAL  Golan Moinuddin 6/27/2025	
US 311/NC 135 at SR 2271 (Shakey Road) and SR 2283 (Commerce Drive)		Division 7 Rockingham County Wayodan	
PLAN DATE: June 2025 PREPARED BY: Golan Moinuddin		REVIEWED BY: _____ REVISIONS INIT. DATE	
		SIGNED BY: _____ DATE: 6/27/2025	
		SIG. INVENTORY NO. 07-2075 T1	

FLASHER CIRCUIT MODIFICATION DETAIL

IN ORDER TO INSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

- 1. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
- 2. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
- 3. REMOVE FLASHER UNIT 2.

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

OUTPUT CHANNEL CONFIGURATION

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

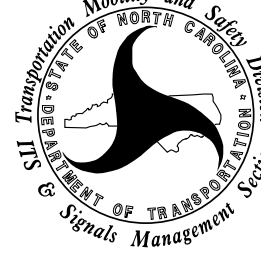
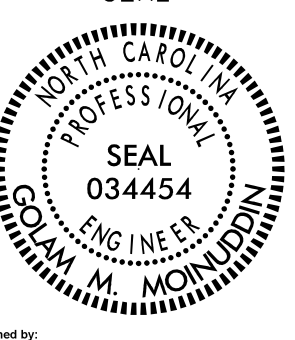
Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-2075 T2
DESIGNED: June 2025
SEALED: 6/27/2025
REVISED: N/A

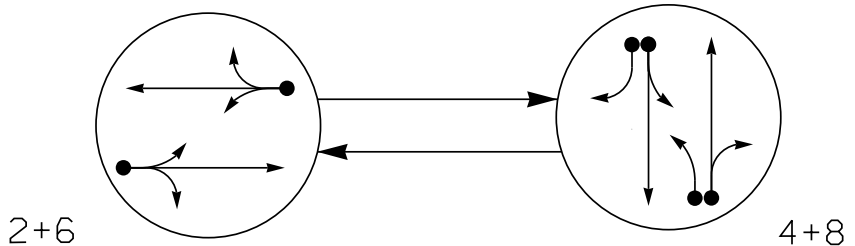
Signal Upgrade - Temporary Design 1 (TMP Phase II)
Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	US 311/NC 135 at SR 2271(Shakey Road) and SR 2283 (Commerce Drive)		 Signed by:  DATE: 6/27/2025 SIG. INVENTORY NO. 07-2075 T1	
	Division 7	Rockingham County		Wayodan
	PLAN DATE: June 2025	REVIEWED BY: _____		
	PREPARED BY: Golan Moinuddin	REVIEWED BY: _____		
	REVISIONS	INIT.		DATE

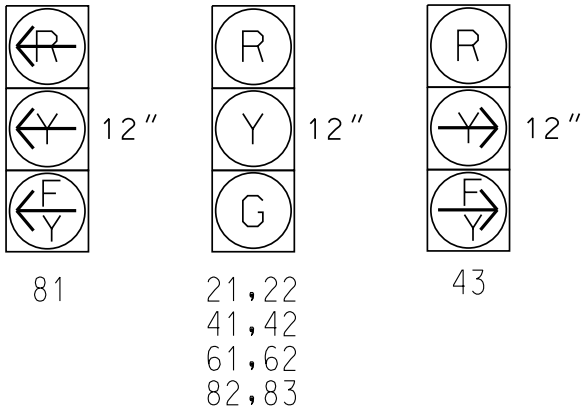
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SIGNAL FACE	PHASE		
	2 + 6	4 + 8	F L A S H
21, 22	G	R	R
41, 42	R	G	R
43	R	$\overline{F}$	R
61, 62	G	R	R
81	$\overline{R}$	$\overline{F}$	$\overline{R}$
82, 83	R	G	R

All Heads L.E.D.



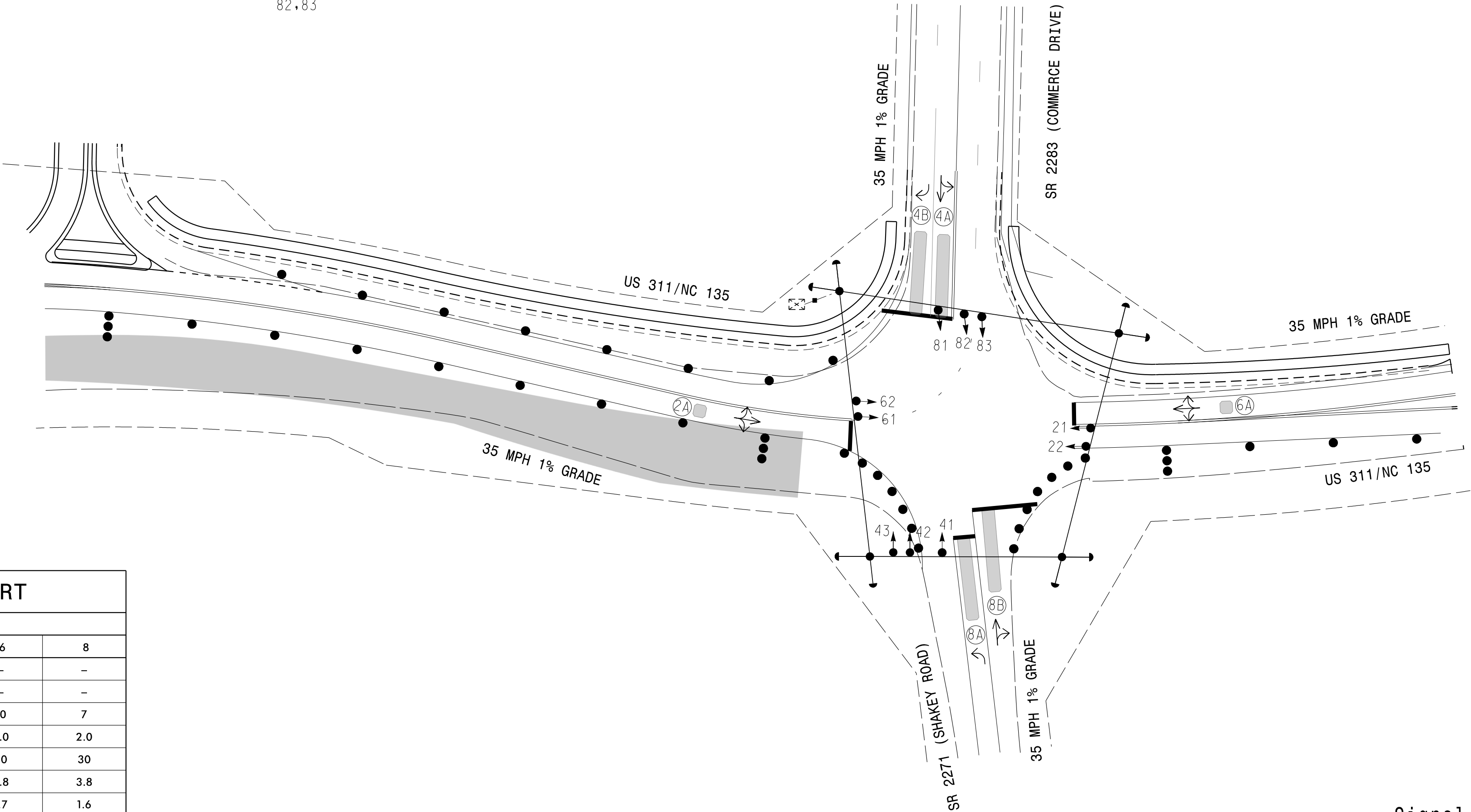
DETECTOR					PROGRAMMING								
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD	
2A*	6X6	70	*	*	2	-	-	X	-	X	-	-	
4A*	6X40	0	*	*	4	3.0	-	X	-	X	-	-	
4B*	6X40	0	*	*	4	15.0	-	X	-	X	-	-	
6A*	6X6	70	*	*	6	-	-	X	-	X	-	-	
8A*	6X40	0	*	*	8	3.0	-	X	-	X	-	-	
8B*	6X40	0	*	-	8	10.0	-	X	-	X	-	-	

* Video Detection Zone

Signal System #: D07-09_Mayodan

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Reposition existing signalheads numbered 2L, 2R, 4L, 6L, and 6R.
4. Set all detector units to presence mode.
5. This intersection uses video detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



MAXTIME TIMING CHART				
FEATURE	PHASE			
	2	4	6	8
Walk *	—	—	—	—
Ped Clear	—	—	—	—
Min Green *	10	7	10	7
Passage *	3.0	2.0	3.0	2.0
Max I *	60	30	60	30
Yellow Change	3.8	3.8	3.8	3.8
Red Clear	1.7	1.6	1.7	1.6
Added Initial *	—	—	—	—
Maximum Initial *	—	—	—	—
Time Before Reduction *	—	—	—	—
Time To Reduce *	—	—	—	—
Minimum Gap	—	—	—	—
Advance Walk	—	—	—	—
Non Lock Detector	—	X	—	X
Vehicle Recall	MIN RECALL	—	MIN RECALL	—
Dual Entry	—	X	—	X

* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

PROPOSED	LEGEND	EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Signal	
	Pedestrian Signal Head	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
	Right of Way	
	Directional Arrow	
	Non-Intrusive Detection Zone	
	Construction Zone Drums	
	Construction Zone	

Signal Upgrade - Temporary Design 2
(TMP Phase IV - Step 1)

Plans Prepared in the Offices of:

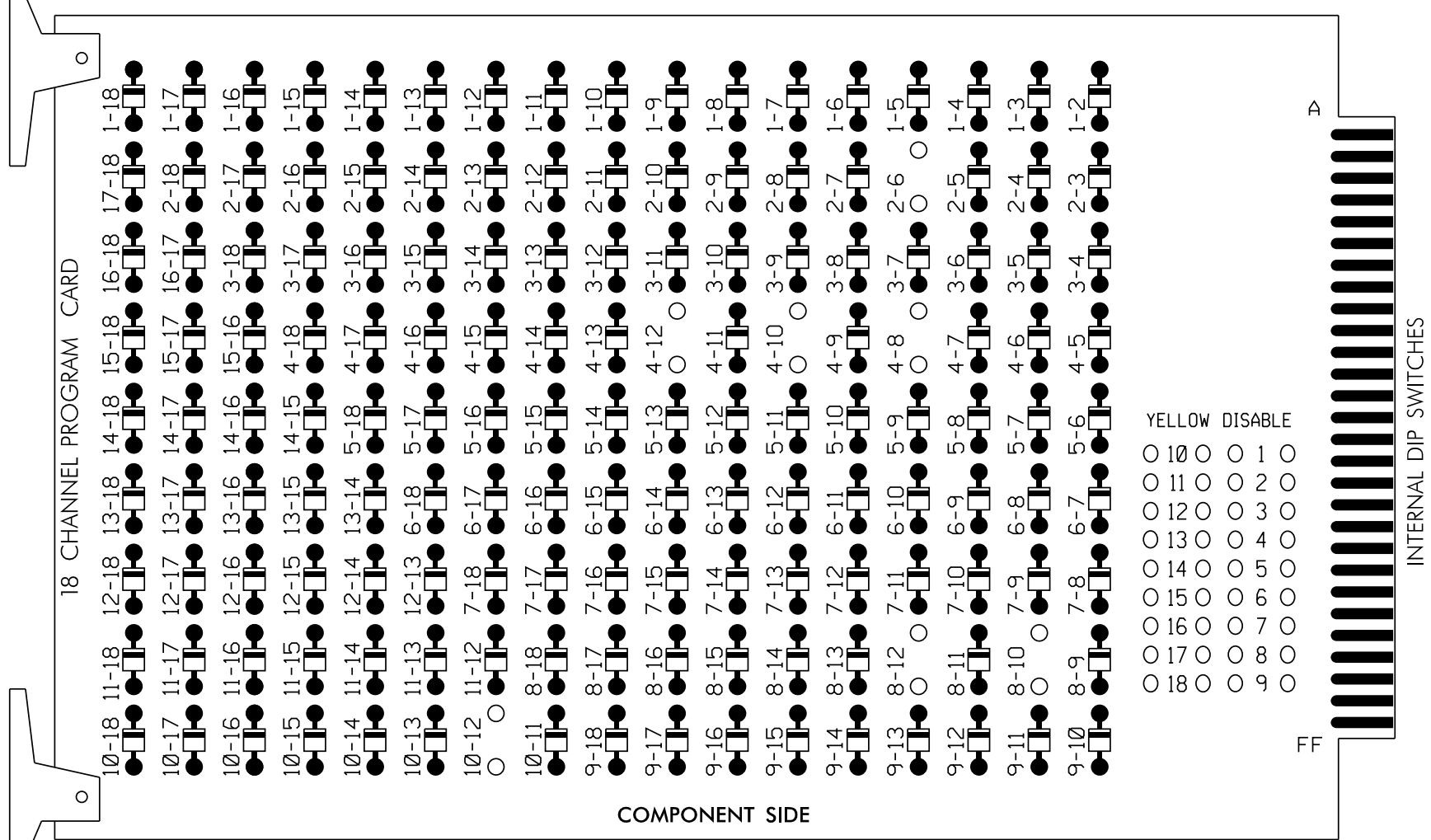
JMT® **Johnson, Mirmiran, & Thompson Inc.**
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Raleigh, NC, 27606
License No: C-3097

Prepared For the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	US 311 / NC 135 at SR 2271 (Shakey Road) and SR 2283 (Commerce Drive) Division 7 Rockingham County Mayodan <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;"> PLAN DATE: June 2025 PREPARED BY: Jamal Khdeir </td> <td style="width: 50%;"> REVIEWED BY: Golam Moineddin REVIEWED BY: _____ </td> </tr> </table>	PLAN DATE: June 2025 PREPARED BY: Jamal Khdeir	REVIEWED BY: Golam Moineddin REVIEWED BY: _____	SEAL  Signed by <u>Golam Moineddin</u> 102897/CB8272/MEC SIGNATURE DATE 8/27/2025																															
PLAN DATE: June 2025 PREPARED BY: Jamal Khdeir	REVIEWED BY: Golam Moineddin REVIEWED BY: _____																																		
 0 40 1" = 40'	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">REVISONS</th> <th style="width: 20%;">INIT.</th> <th style="width: 20%;">DATE</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table> 516. INVENTORY NO. 07-2075 12		REVISONS	INIT.	DATE																														
REVISONS	INIT.	DATE																																	

18 CHANNEL IP CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-6, 4-8, 4-10, 4-12, 8-10, 8-12, and 10-12.



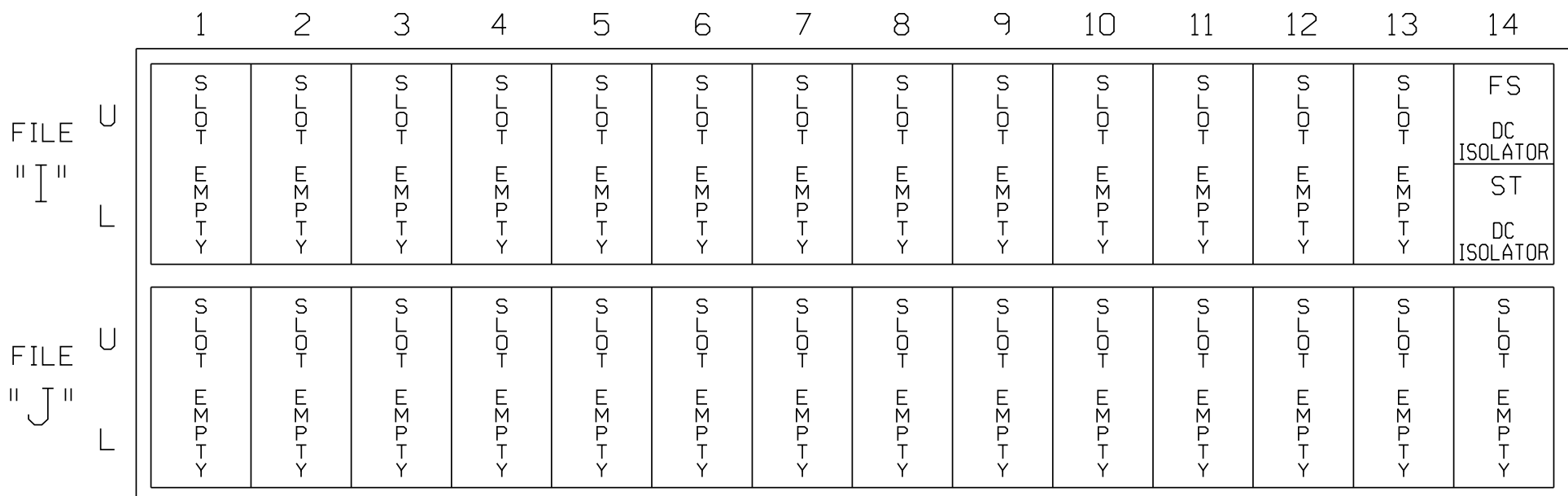
REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that the Red Enable is active at all times during normal operation.
- Integrate monitor with Ethernet network in cabinet.

INPUT FILE POSITION LAYOUT

(front view)



EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

FLASHER CIRCUIT MODIFICATION DETAIL

IN ORDER TO INSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

- ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
- ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
- REMOVE FLASHER UNIT 2.

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.

2. Program phases 4 and 8 for Dual Entry.

3. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.

4. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.

5. The cabinet and controller are part of the Signal System #: D07-09_Mayodan

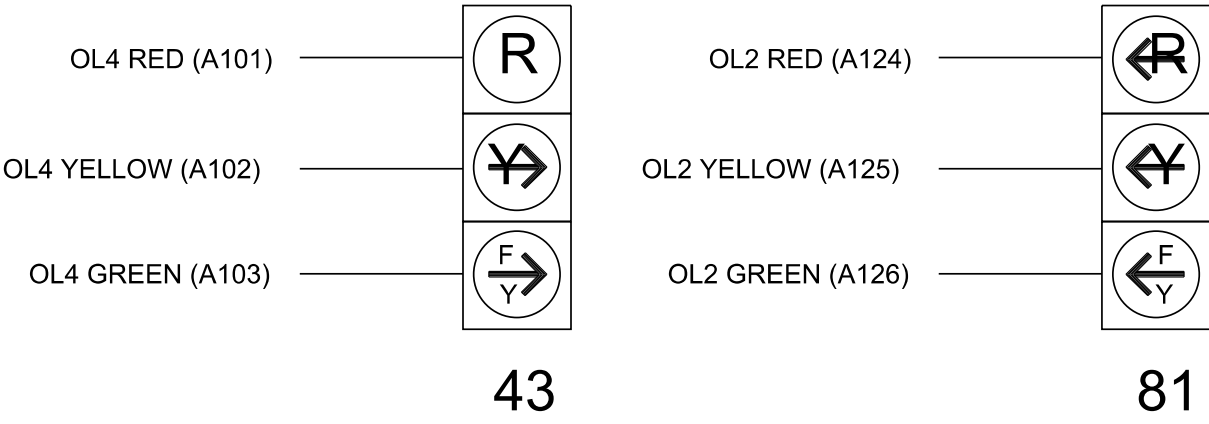
EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S2, S5, S8, S11, AUX S2, AUX S5
Phases Used.....2, 4, 6, 8
Overlap "1".....NOT USED
Overlap "2".....*
Overlap "3".....NOT USED
Overlap "4".....*

*See overlap programming detail

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



SPECIAL DETECTOR NOTE

Install a video detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-2075 T2
DESIGNED: June 2025
SEALED: 6/27/2025
REVISED: N/A

Signal Upgrade - Temporary Design 2 (TMP Phase IV - Step 1)
Electrical Detail - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:		US 311/NC 135 at SR 2271(Shakey Road) and SR 2283 (Commerce Drive)		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared for the Offices of: 		Division 7 Rockingham County Wayodan		SEAL NORTH CAROLINA PROFESSIONAL SEAL 034454 ENGINEER GOLAM M. MOINUDDIN	
PLAN DATE: June 2025		REVIEWED BY:		Signed by: 6/27/2025 DATE	
PREPARED BY: Golam Moinuddin		REVIEWED BY:		6/27/2025 DATE	
REVISIONS		INIT.		DATE	
750 N. Greenfield Pkwy, Corner, NC 27529				SIG. INVENTORY NO. 07-2075 T2	

Prepared in the Offices of:

Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27606
License No: C-3097

PROJECT REFERENCE NO.	SHEET NO.
I-5898	Sig 17.2

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	2	4
Type	FYA 4 - Section	FYA 4- Section
Included Phases	4	4
Modifier Phases	-	-
Modifier Overlaps	-	-
Trail Green	0	0
Trail Yellow	0.0	0.0
Trail Red	0.0	0.0

OUTPUT CHANNEL CONFIGURATION

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

MAXTIME STARTUP AND SOFTWARE FLASH PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home > Controller > Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-2075 T2
DESIGNED: June 2025
SEALED: 6/27/2025
REVISED: N/A

Signal Upgrade - Temporary Design 2 (TMP Phase IV- Step 1)
Electrical Detail - Sheet 2 of 2

**DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED**

Prepared in the Offices of:

JMT *Johnson, Mirmiran, & Thompson Inc.*
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27606
License No: C-3097

5 Phase
Fully Actuated
(NC 135 CLS)
Signal System #: D07-09_Mayodan

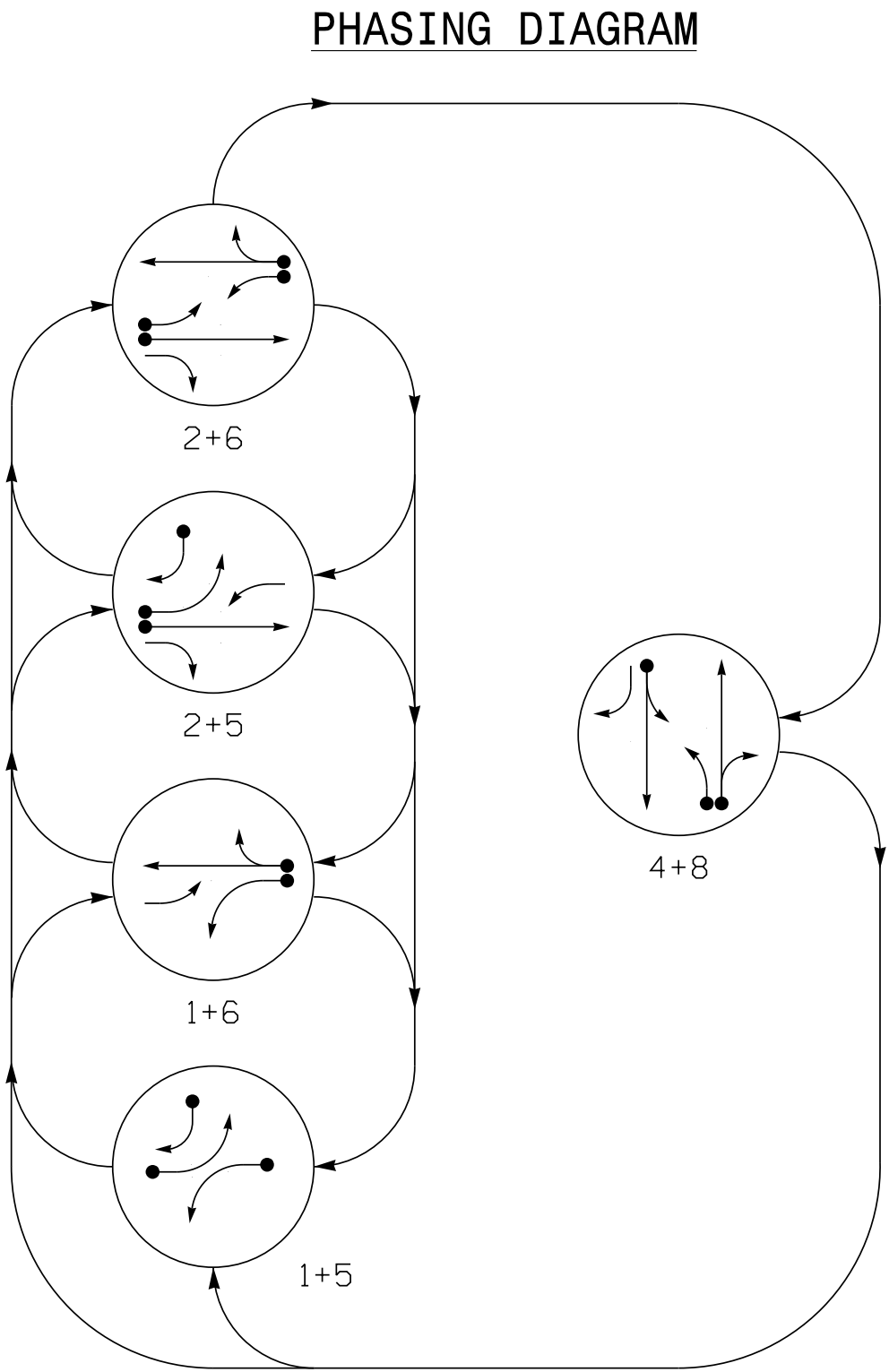
NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase land/or phase 5 may be lagged.
- Reposition existing signalheads numbered 21, 22, 61, and 62.
- Set all detector units to presence mode.
- This intersection uses video detection. Install detectors according to the manufacturer's instruction to achieve the desired detection.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

TABLE OF OPERATION						
SIGNAL FACE	PHASE					
	1 + 5	1 + 6	2 + 5	2 + 6	4 + 8	FLASH
11	←	←	←	←	←	
21, 22	R	R	G	G	R	R
23	R	R	←	←	R	R
41		R	R	R	G	R
42	R	R	R	R	G	R
51	←	←	←	←	←	
61, 62	R	G	R	G	R	R
81	←	←	←	←	←	
82, 83	R	R	R	R	G	R

MAXTIME DETECTOR INSTALLATION CHART												
DETECTOR						PROGRAMMING						
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
1A*	6X40	0	*	*	1	15.0	-	X	-	X	-	*
					6	-	-	X	-	X	-	*
2A*	6X6	70	*	*	2	-	-	X	-	X	-	-
4A*	6X40	0	*	-	4	3.0	-	X	-	X	-	-
5A*	6X40	0	*	*	5	15.0	-	X	-	X	-	*
					2	-	-	X	-	X	-	*
5B*	6X40	0	*	-	5	15.0	-	X	-	X	-	-
6A*	6X6	70	*	*	6	-	-	X	-	X	-	-
8A*	6X40	0	*	-	8	3.0	-	X	-	X	-	-
8B*	6X40	0	*	-	8	10.0	-	X	-	X	-	-

* Video Detection Zone

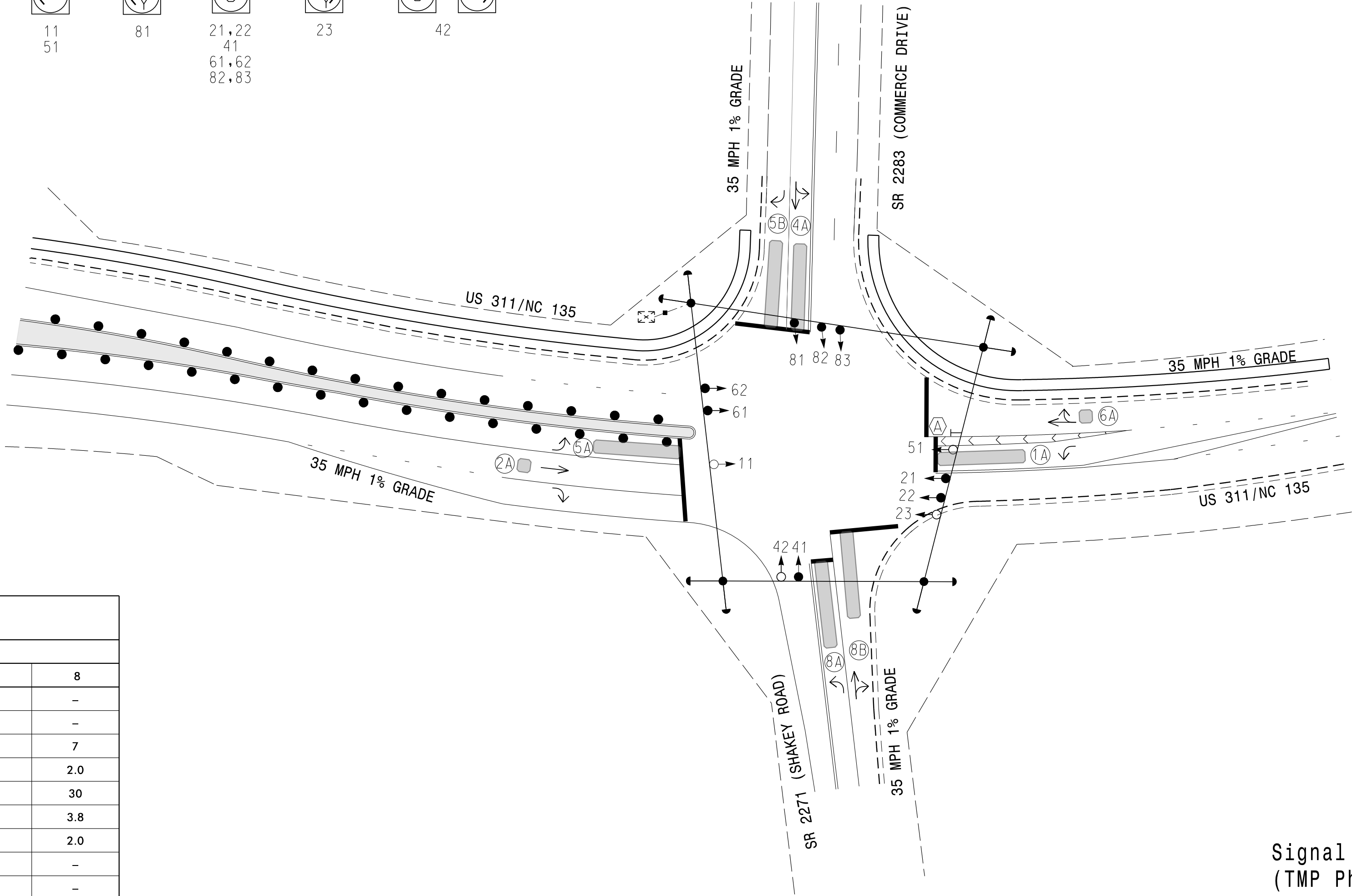
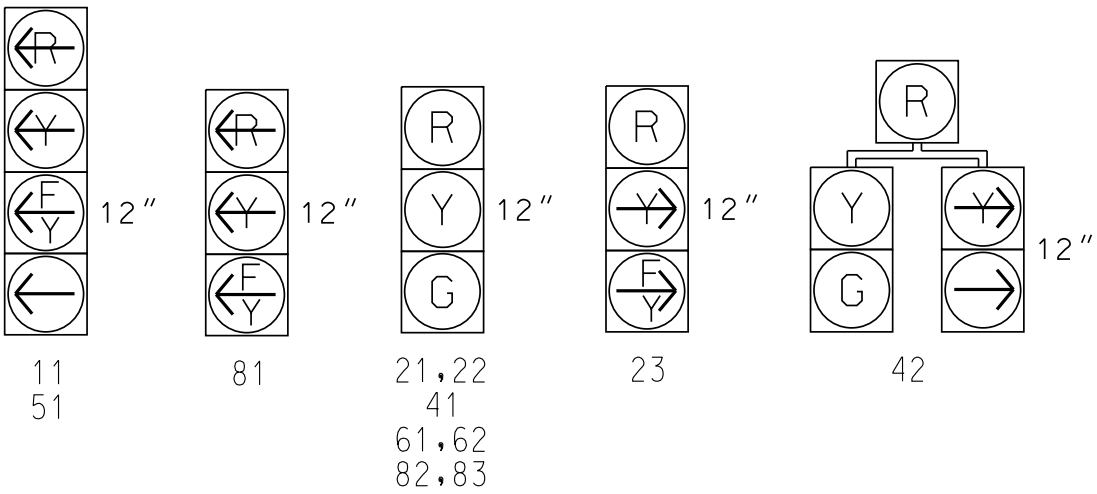


PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT

SIGNAL FACE I.D.

All Heads L.E.D.



MAXTIME TIMING CHART						
FEATURE	PHASE					
	1	2	4	5	6	8
Walk *	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-
Min Green *	7	10	7	7	10	7
Passage *	2.0	3.0	2.0	2.0	3.0	2.0
Max I *	20	90	30	20	90	30
Yellow Change	3.0	3.8	3.8	3.0	3.8	3.8
Red Clear	2.6	1.8	2.0	2.4	1.8	2.0
Added Initial *	-	-	-	-	-	-
Maximum Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Advance Walk	-	-	-	-	-	-
Non Lock Detector	X	-	X	X	-	X
Vehicle Recall	-	MIN RECALL	-	-	MIN RECALL	-
Dual Entry	-	-	X	-	-	X

* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

- | PROPOSED | EXISTING |
|--|----------|
| Traffic Signal Head | N/A |
| Modified Signal Head | N/A |
| Sign | N/A |
| Pedestrian Signal Head | N/A |
| Signal Pole with Guy | N/A |
| Signal Pole with Sidewalk Guy | N/A |
| Inductive Loop Detector | N/A |
| Controller & Cabinet | N/A |
| Junction Box | N/A |
| 2-in Underground Conduit | N/A |
| Right of Way | N/A |
| Directional Arrow | N/A |
| Non-Intrusive Detection Zone | N/A |
| Construction Zone Drums | N/A |
| Construction Zone | N/A |
| "U-TURN YIELD TO RIGHT TURN" Sign (R10-16) | N/A |

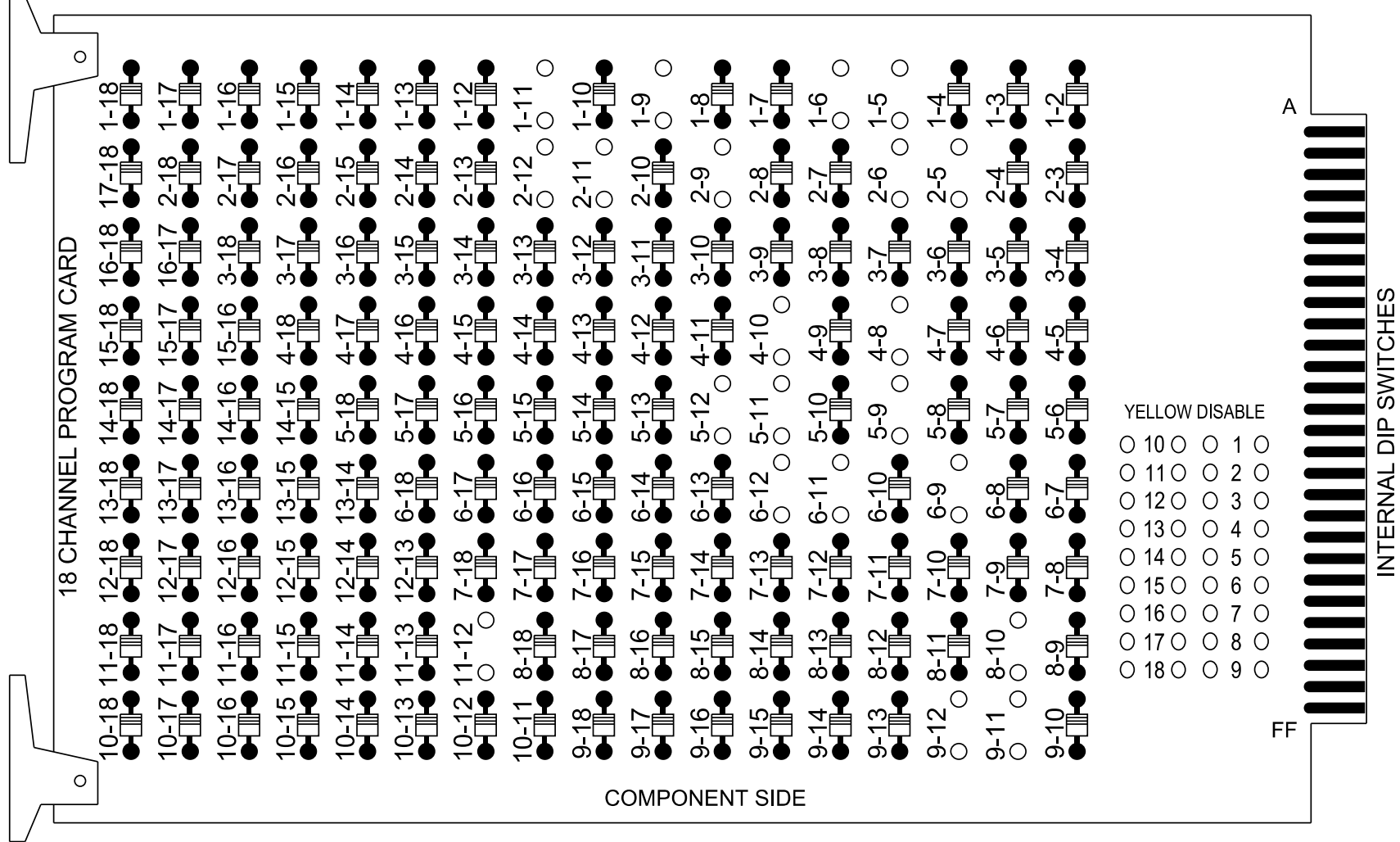
Signal Upgrade - Temporary Design 3
(TMP Phase IV - Step 2)

	US 311 / NC 135 at SR 2271 (Shakey Road) and SR 2283 (Commerce Drive) Division 7 Rockingham County Mayodan	SEAL NORTH CAROLINA PROFESSIONAL ENGINEER GOLAM MOINUDDIN 034454 6/27/2025
	Prepared for the Offices of: Transportation Mobility and Safety Division JMT 750 N. Greenfield Pkwy, Garner, NC 27529 Plans Prepared in the Offices of: Johnson, Mirmiran, & Thompson Inc. 4700 Falls of Neuse Rd, Suite 100, Raleigh, NC, 27606 License No: C-3097	PLAN DATE: June 2025 REVIEWED BY: Golam Moinuiddin PREPARED BY: Jamal Khdeir REVIEWED BY: REVISIONS INITIALS DATE

18 CHANNEL IP CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

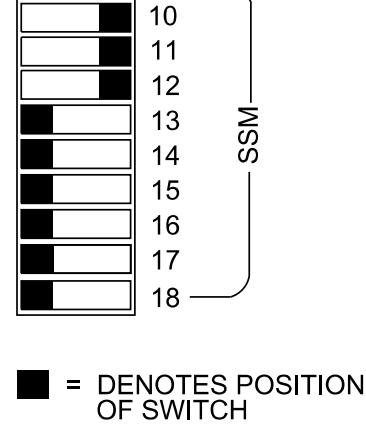
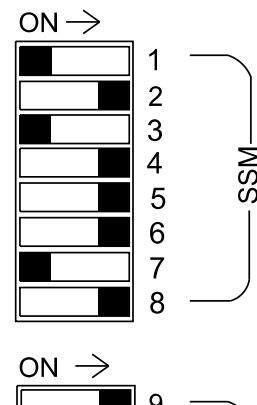
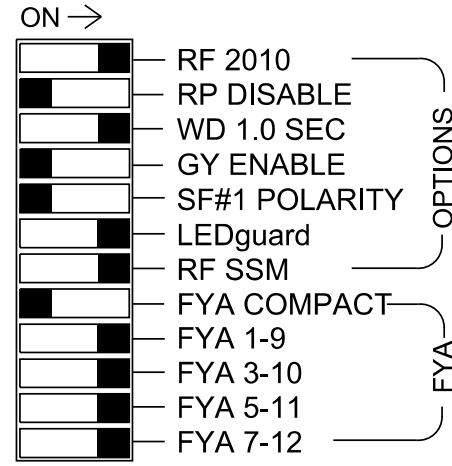
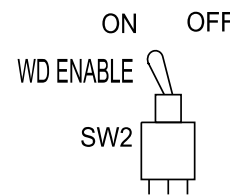
REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 2-5, 2-6, 2-9, 2-11, 2-12, 4-8, 4-10, 5-9, 5-11, 5-12, 6-9, 6-11, 6-12, 8-10, 9-11, 9-12, and 11-12.



REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that the Red Enable is active at all times during normal operation.
- Integrate monitor with Ethernet network in cabinet.



NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
- Program phases 4 and 8 for Dual Entry.
- Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- The cabinet and controller are part of the Signal System #: D07-09_Mayodan

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S1, S2, S5, S7, S8, S11, AUX S1
AUX S2, AUX S4, AUX S5
Phases Used.....1, 2, 4, 5, 6, 8
Overlap "1".....*
Overlap "2".....*
Overlap "3".....*
Overlap "4".....*

*See overlap programming detail

PROJECT REFERENCE NO.	SHEET NO.
I-5898	Sig 18.1

SIGNAL HEAD HOOK-UP CHART

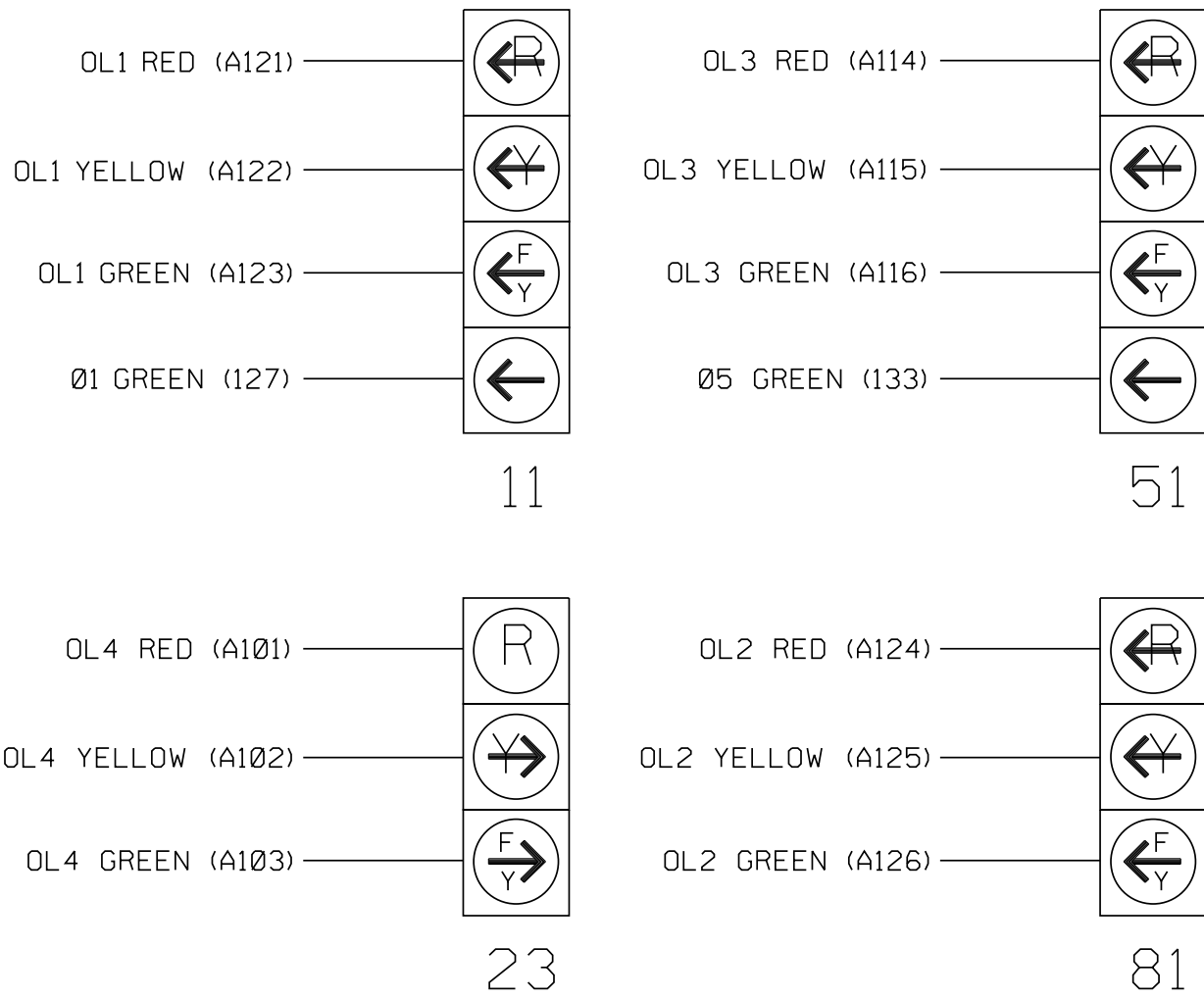
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	11★	21,22	NU	NU	41,42	NU	51★	42	61,62	NU	NU	82,83	NU	11★	81★	NU	51★	23★
RED		128			101		★	134			107							A101
YELLOW	★	129			102			135			108							
GREEN		130			103			136			109							
RED ARROW													A121	A124		A114		
YELLOW ARROW							132						A122	A125		A115	A102	
FLASHING YELLOW ARROW													A123	A126		A116	A103	
GREEN ARROW	127						133	133										

NU = Not Used

- ★ Denotes install load resistor. See load resistor installation detail this sheet.
- ★ See pictorial of head wiring in detail this sheet.

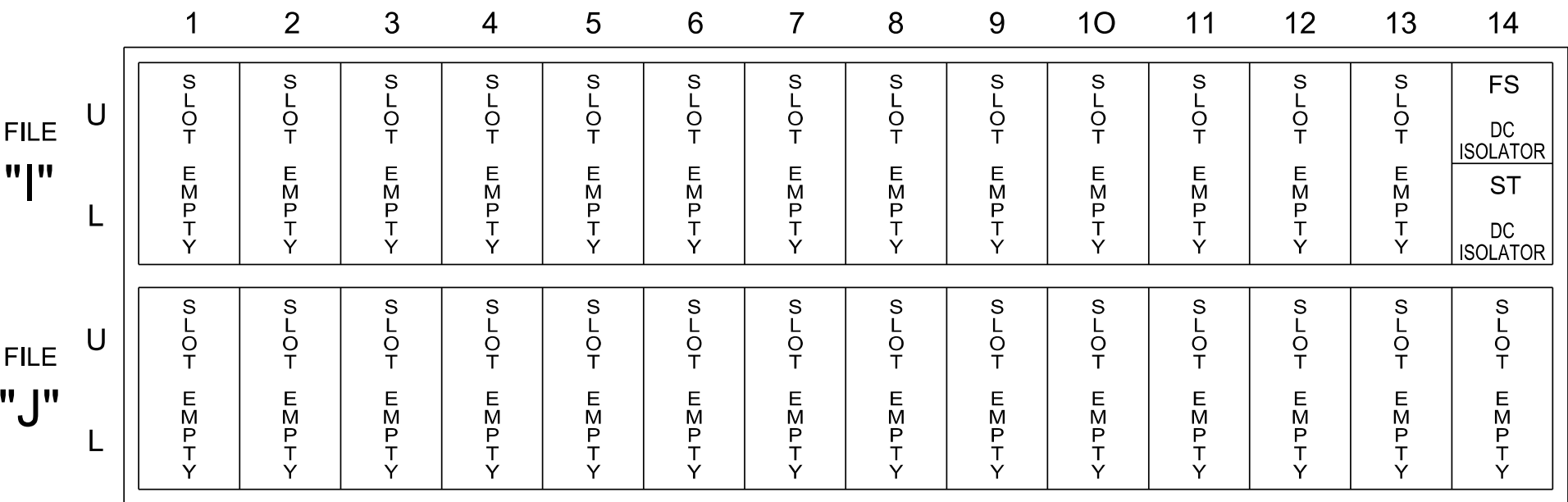
FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE POSITION LAYOUT

(front view)



EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

SPECIAL DETECTOR NOTE

Install a video detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

OVERLAP PROGRAMMING

Front Panel

Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface

Home >Controller >Overlap Configuration >Overlaps

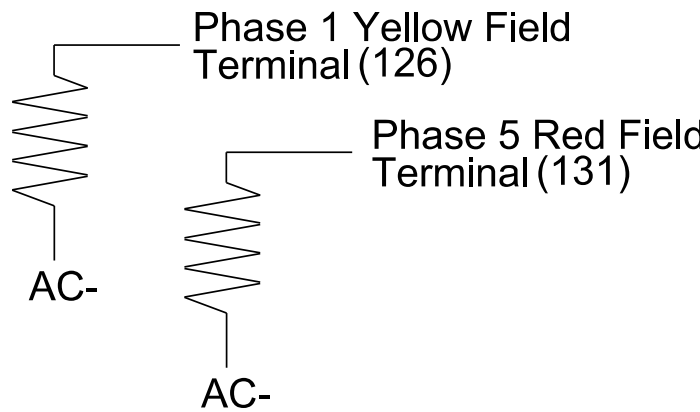
Overlap Plan 1

Overlap	1	2	3	4
Type	FYA 4 - Section	FYA 4- Section	FYA 4 - Section	FYA 4- Section
Included Phases	2	4	6	2
Modifier Phases	1	-	5	-
Modifier Overlaps	-	-	-	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

ACCEPTABLE VALUES	
Value (ohms)	Wattage
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-2075 T3
DESIGNED: June 2025
SEALED: 6/27/2025
REVISED: N/A

Signal Upgrade -- Temp Design 3 (IMP Phase IV -- Step 2) --
Electrical Detail -- Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:		US 311/NC 135		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared for the Offices of:		at		SEAL	
SR 2271 (Shake Road) and		SR 2283 (Commerce Drive)		SEAL	
Division 7		Rockingham County		Wayodan	
PLAN DATE: June 2025		REVIEWED BY:		DATE	
PREPARED BY: Golam Moinuddin		REVIEWED BY:		DATE	
REVISIONS		INIT.		DATE	
750 N.Greenfield Pkwy,Corner,NC 27529					
Prepared in the Offices of:		Johnson, Mirmiran, & Thompson Inc.		6/27/2025	
4700 Falls of Neuse Rd, Suite 100,		Raleigh, NC, 27606		DATE	
License No: C-3097					
				Sig. Inventory No. 07-2075 T3	

I-5898	Sig 18.2
--------	----------

Front Panel
Main Menu >Controller >Unit

Web Interface
Home > Controller > Unit

Modify parameters as shown below and save changes.

StartUp Clearance Hold
6

All Red Flash Exit Time
6

IN ORDER TO INSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

1. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
2. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
3. REMOVE FLASHER UNIT 2.

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-2075 T3
DESIGNED: June 2025
SEALED: 6/27/2025
REVISED: N/A

Signal Upgrade - Temp Design 3 (TMP Phase IV - Step 2) -
Electrical Detail - Sheet 2 of 2

**DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED**

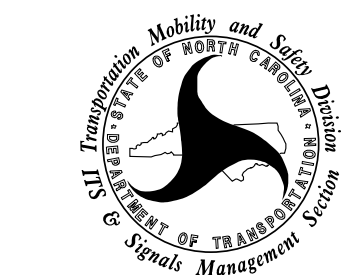
Prepared in the Offices of:



Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27606
License No: C-3097

**ELECTRICAL AND PROGRAMMING
DETAILS FOR:**

Prepared for the Offices of:



750 N.Greenfield Pkwy,Garner,NC 27529

US 311 / NC 135

at
SR 2271 (Shakey Road) and
SR 2283 (Commerce Drive)

Division 7 Rockingham County Mayodan

PLAN DATE: June 2025	REVIEWED BY: _____
----------------------	--------------------

Golam Moinuddin

REVISIONS

.....		

[illegible]

SF AI



Signed by

Salam Maimuddin.

92897C8B27EDMEC 6/27

SIG. INVENTORY NO. 07-2075 T3

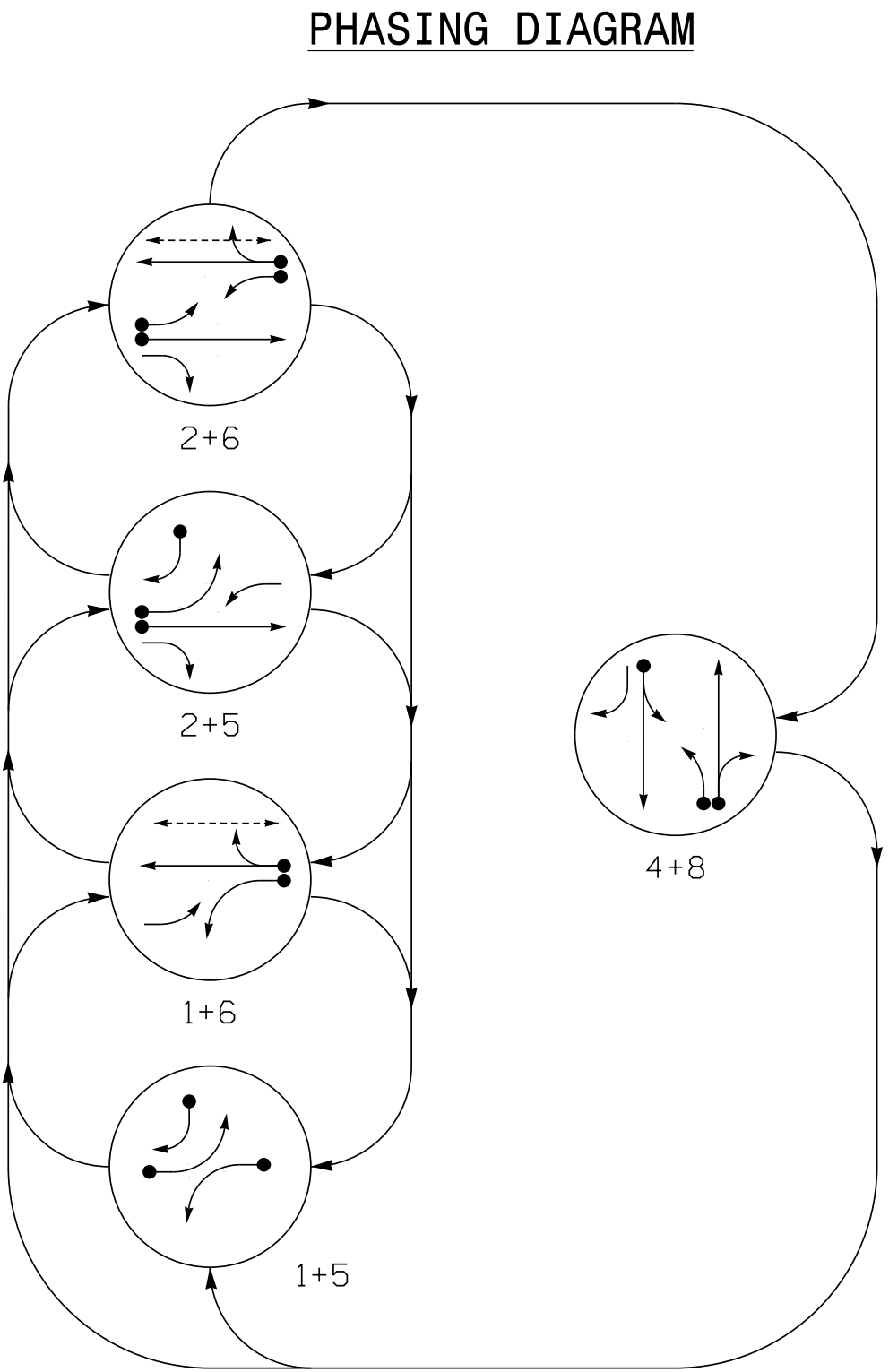
5 Phase
Fully Actuated
(NC 135 CLS)
Signal System #: D07-09_Mayodan

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

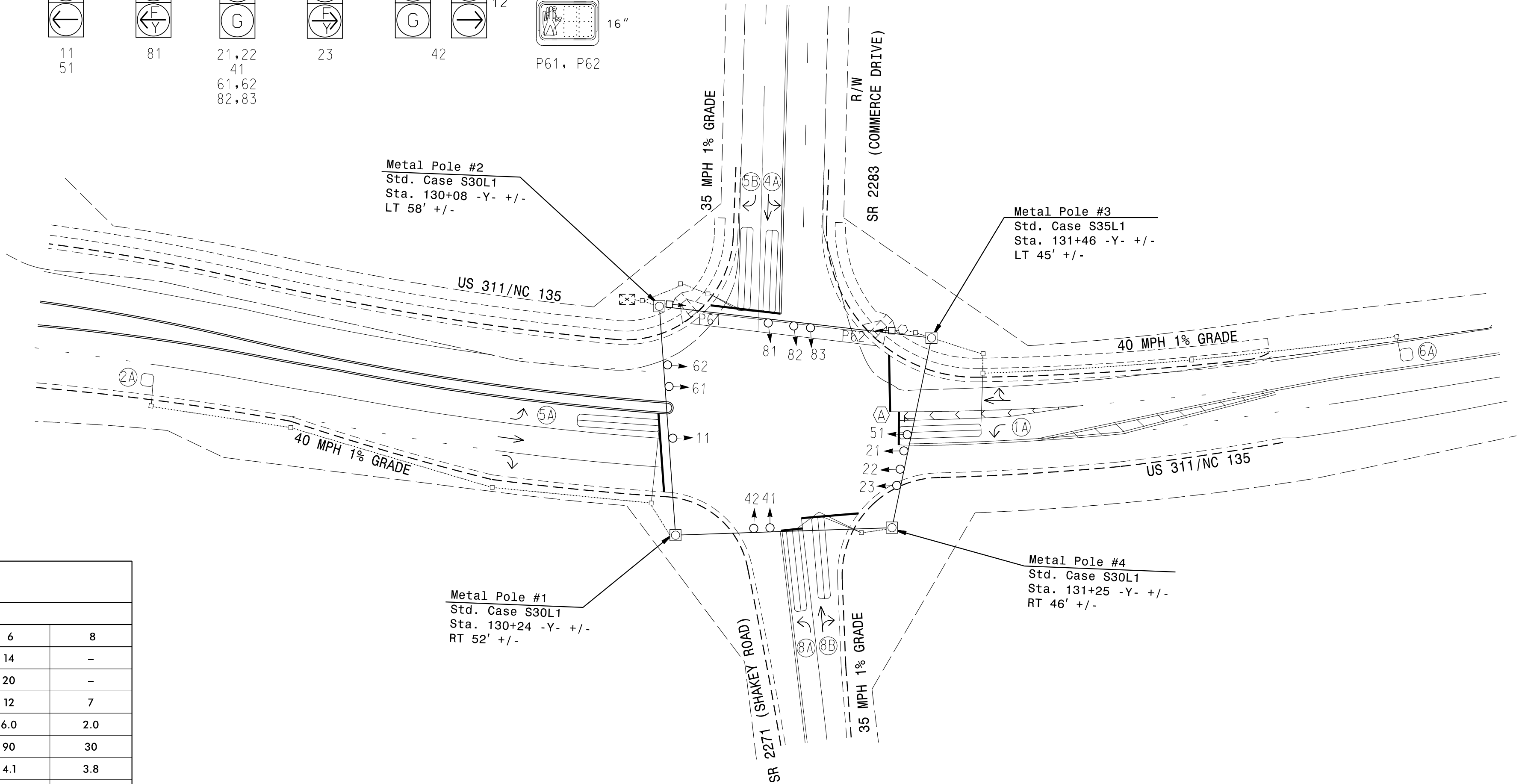
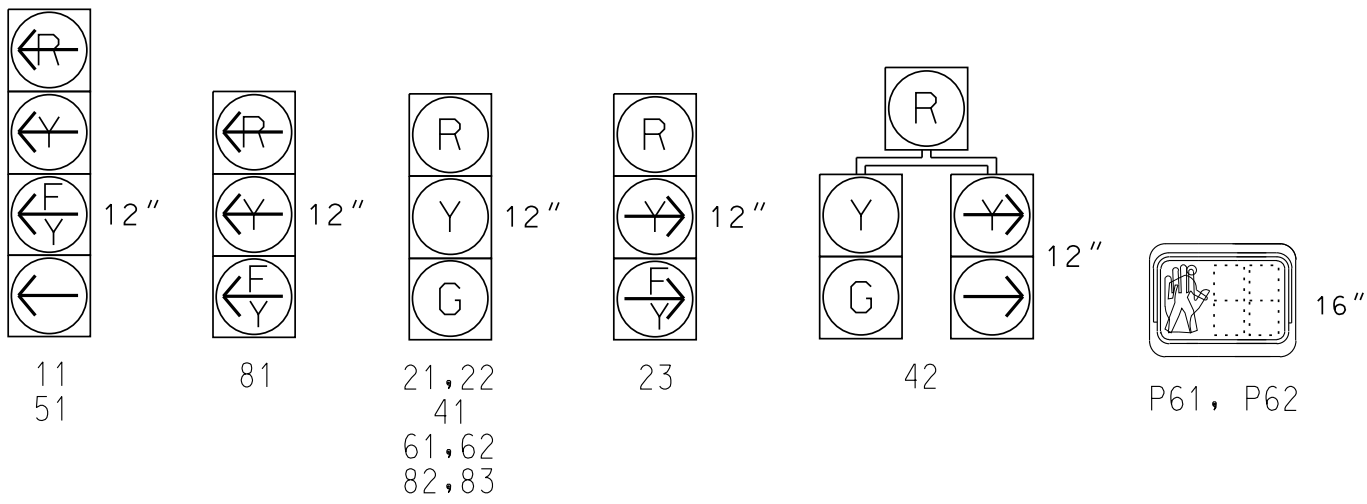
SIGNAL FACE	PHASE					FLASH
	1 + 5	1 + 6	2 + 5	2 + 6	4 + 8	
11	←	←	←	←	←	←
21, 22	R	R	G	G	R	R
23	R	R	←	←	R	R
41	R	R	R	R	G	R
42	R	R	R	R	G	R
51	←	←	←	←	←	←
61, 62	R	G	R	G	R	R
81	←	←	←	←	←	←
82, 83	R	R	R	R	G	R
P61, P62	DW	W	DW	W	DW	DRK

MAXTIME DETECTOR INSTALLATION CHART											
DETECTOR						PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	NEW CARD
1A	6X40	0	2-4-2	X	1	15.0	-	X	-	X	-
					6	3.0	-	X	-	X	X
2A	6X6	250	5	X	2	-	-	X	X	X	-
4A	6X40	0	2-4-2	X	4	3.0	-	X	-	X	-
5A	6X40	0	2-4-2	X	5	15.0	-	X	-	X	-
					2	3.0	-	X	-	X	X
5B	6X40	0	2-4-2	X	5	15.0	-	X	-	X	-
6A	6X6	250	5	X	6	-	-	X	X	X	-
8A	6X40	0	2-4-2	X	8	3.0	-	X	-	X	-
8B	6X40	0	2-4-2	X	8	10.0	-	X	-	X	-



SIGNAL FACE I.D.

All Heads L.E.D.



FEATURE	PHASE					
	1	2	4	5	6	8
Walk *	-	-	-	-	14	-
Ped Clear	-	-	-	-	20	-
Min Green *	7	12	7	7	12	7
Passage *	2.0	6.0	2.0	2.0	6.0	2.0
Max 1 *	20	90	30	20	90	30
Yellow Change	3.0	4.1	3.8	3.0	4.1	3.8
Red Clear	2.6	1.7	1.9	2.8	1.7	1.8
Added Initial *	-	2.5	-	-	2.5	-
Maximum Initial *	-	30	-	-	30	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	30	-	-	30	-
Minimum Gap	-	3.0	-	-	3.0	-
Advance Walk	-	-	-	-	7	-
Non Lock Detector	X	-	X	X	-	X
Vehicle Recall	-	MIN RECALL	-	-	MIN RECALL	-
Dual Entry	-	-	X	-	-	X

* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

PROPOSED	EXISTING

Signal Upgrade - Final Design

Prepared for the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27529	US 311 / NC 135 at SR 2271 (Shakey Road) and SR 2283 (Commerce Drive) Division 7 - Rockingham County PLAN DATE: June 2025 PREPARED BY: Jamal Khdeir REVIEWED BY: Golam Moynuddin	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED SEAL GOLAM MOYNUDDIN PROFESSIONAL ENGINEER SEAL 034454 SIGNED BY: Golam Moynuddin 6/27/2025 DATE SIGNATURE DATE SIC. INVENTORY NO. 07-2075
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Plans Prepared in the Offices of:

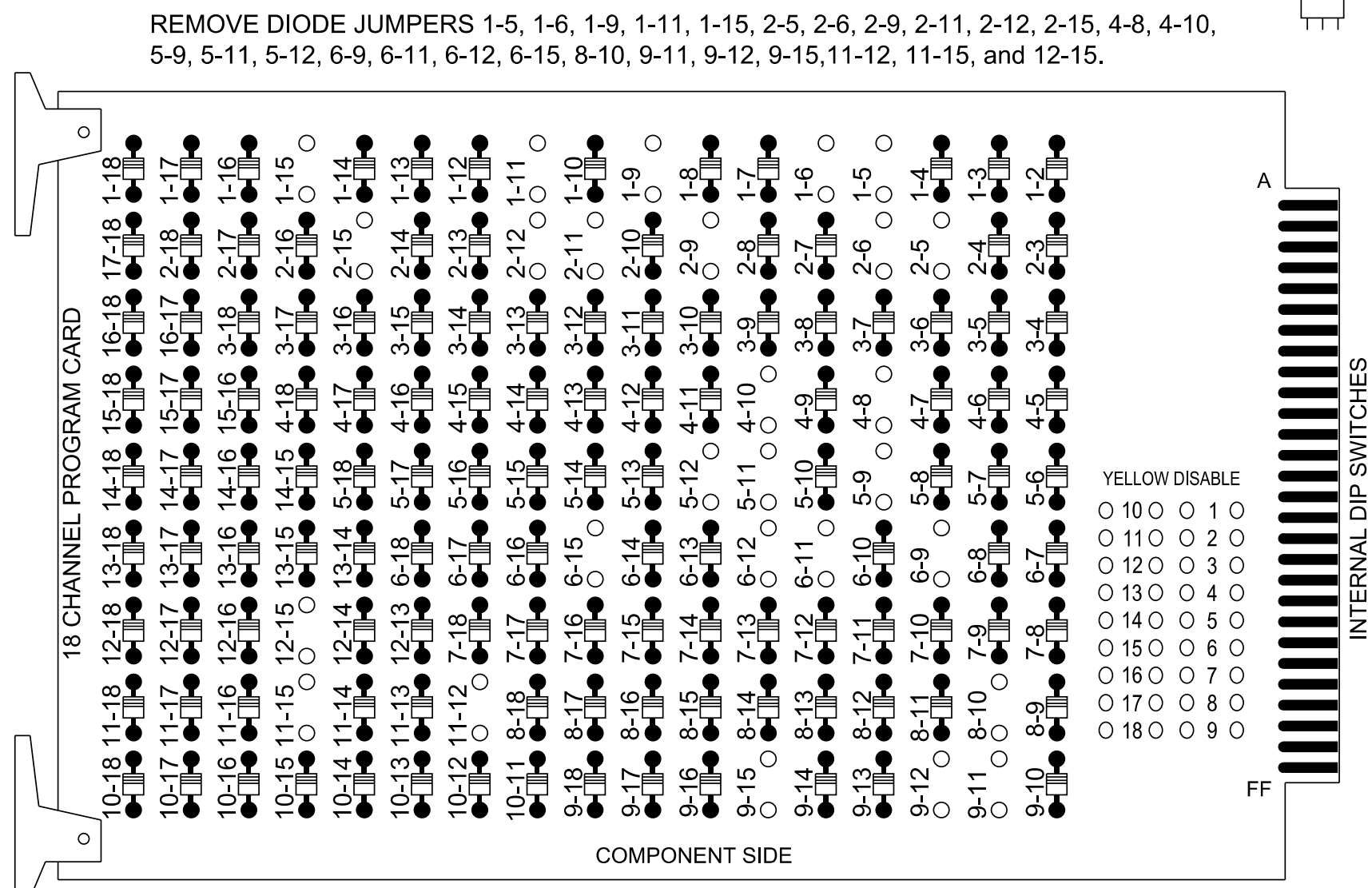
Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27606
License No: C-3097

18 CHANNEL IP CONFLICT MONITOR

PROGRAMMING DETAIL

PROGRAMMING DETAIL

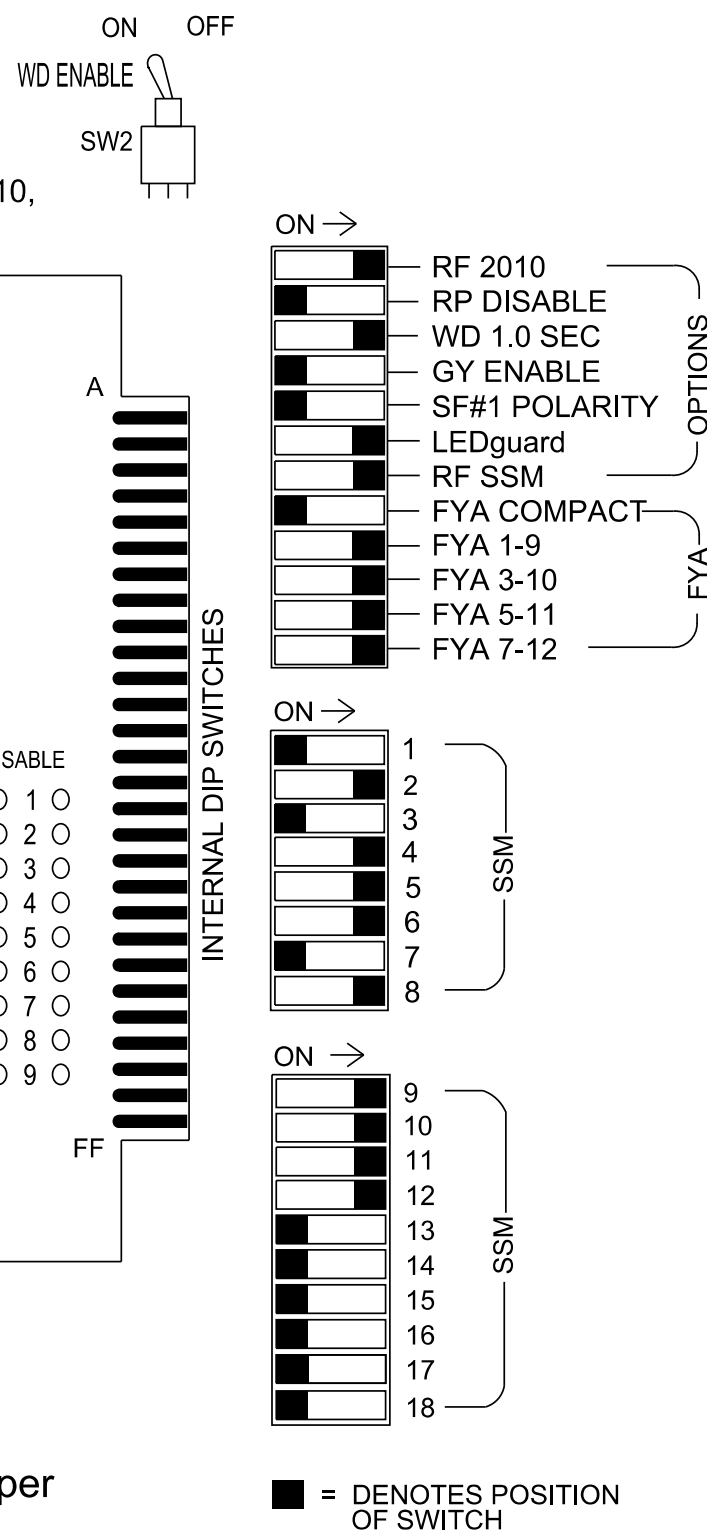
(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that the Red Enable is active at all times during normal operation.
4. Integrate monitor with Ethernet network in cabinet..



NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Program phases 4 and 8 for Dual Entry.
3. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
4. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
5. The cabinet and controller are part of the Signal System #: D07-09_Mayodan

EQUIPMENT INFORMATION

Controller.....	2070LX
Cabinet.....	332 w/ Aux
Software.....	Q-Free MAXTIME
Cabinet Mount.....	Base
Output File Positions.....	18 With Aux. Output File
Load Switches Used.....	S1, S2, S5, S7, S8, S9, S11, AUX S1, AUX S2, AUX S4, AUX S5
Phases Used.....	1, 2, 4, 5, 6, 6PED, 8
Overlap "1".....	*
Overlap "2".....	*
Overlap "3".....	*
Overlap "4".....	*

*See overlap programming detail on sheet 2

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	TB2-1,2	I1U	56	18 -	1 29	1 6	15.0 3.0		X X		X X	
2A	TB2-5,6	I2U	39	1	2	2	-		X	X	X	
4A	TB4-9,10	I6U	41	3	8	4	3.0		X		X	
5A	TB3-1,2	J1U	55	17 -	15 31	5 2	15.0 3.0		X X		X X	
5B	TB4-11,12	I6L	45	7	9	5	15.0		X		X	
6A	TB3-5,6	J2U	40	2	16	6	-		X	X	X	
8A	TB5-9,10	J6U	42	4	22	8	3.0		X		X	
8B	TB5-11,12	J6L	46	8	23	8	10.0		X		X	
PED PUSH BUTTONS							NOTE: INSTALL DC ISOLATOR IN INPUT FILE SLOT I13.					
P61,P62	TB8-7,9	I13U	68	34	6	PED 6						

*System detector only. Remove any assigned vehicle phase.

INPUT FILE POSITION LAYOUT

(front view)

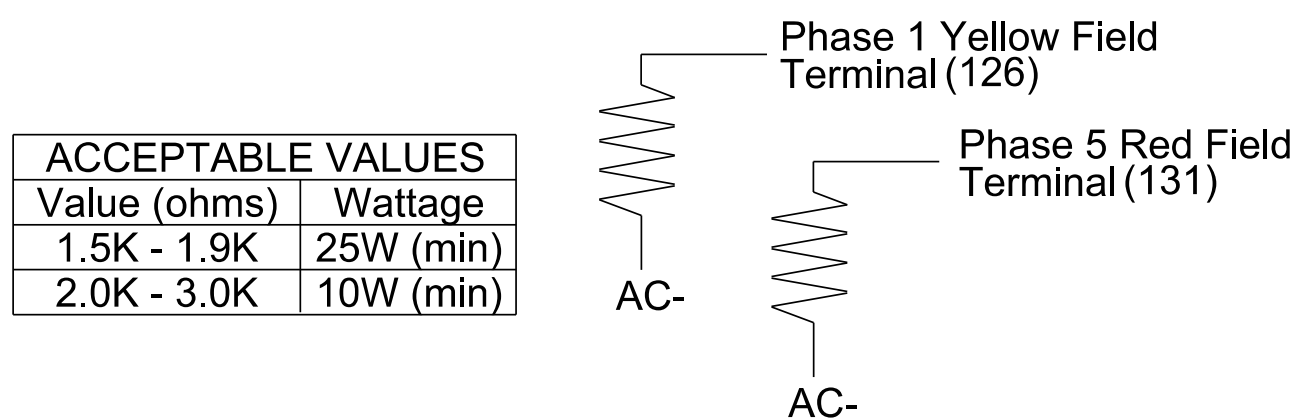
[illegible]

EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)



SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6	
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE	
SIGNAL HEAD NO.	11★	21,22	NU	NU	41,42	NU	51★	42	61,62	P61, P62	NU	82,83	NU	11★	81★	NU	51★	23★	NU
RED		128			101		*	134			107						A101		
YELLOW	*	129			102			135			108								
GREEN		130			103			136			109								
RED ARROW													A121	A124		A114			
YELLOW ARROW							132						A122	A125		A115	A102		
FLASHING YELLOW ARROW													A123	A126		A116	A103		
GREEN ARROW	127						133	133											
									119										
									121										

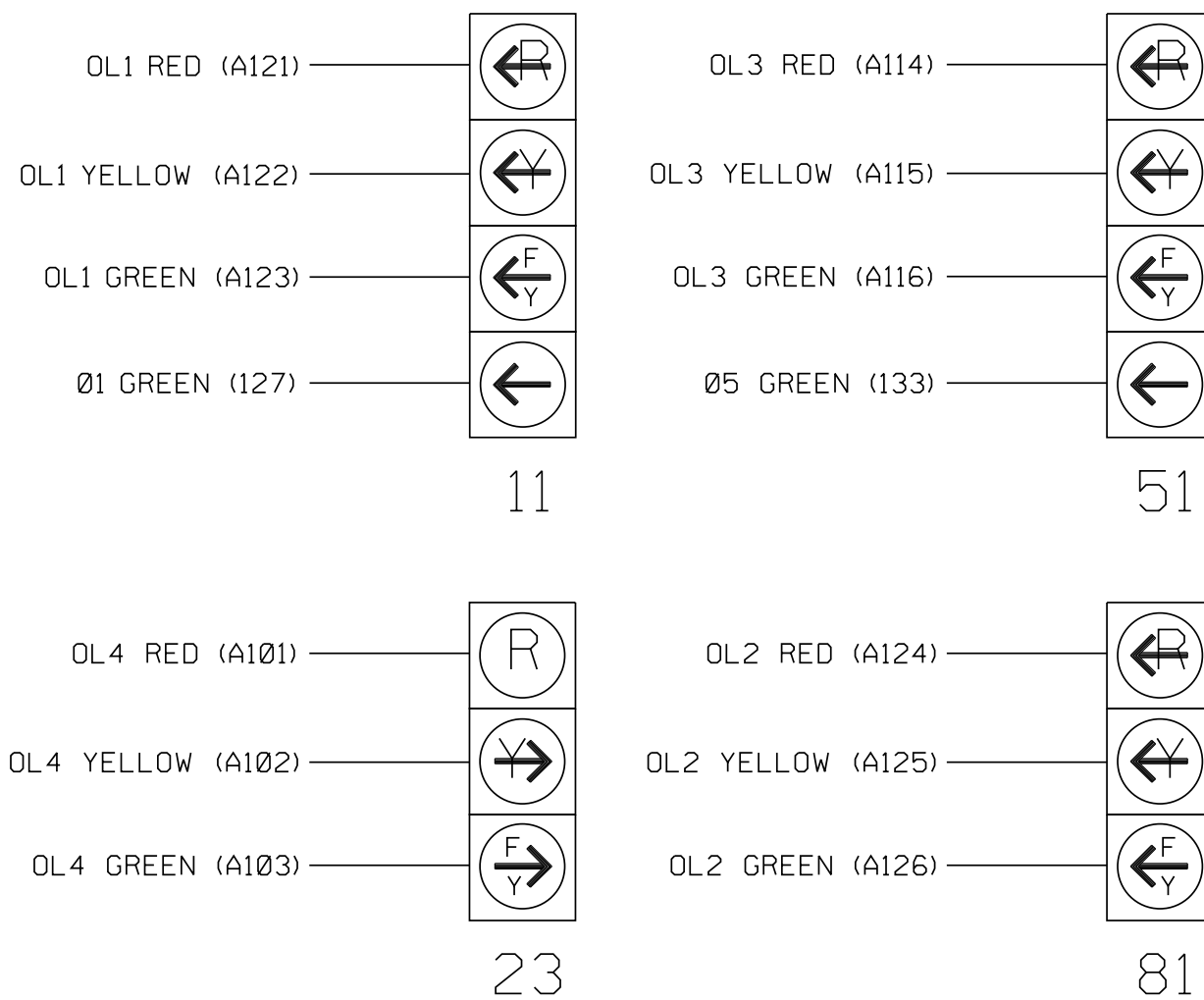
NU = Not Used

* Denotes install load resistor. See load resistor installation detail this sheet.

★ See pictorial of head wiring in detail this sheet.

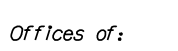
FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-2075
DESIGNED: June 2025
SEALED: 6/27/2025
REVISED: N/A

Signal Upgrade - Final Design
Electrical Detail - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:	US 311/NC 135 at SR 2271 (Shakey Road) and SR 2283 (Commerce Drive)	SEAL 																																	
Prepared for the Offices of: 	Division 7 Rockingham County Mayodan																																		
	PLAN DATE: <u>June 2025</u> REVIEWED BY: _____																																		
	PREPARED BY: <u>Golam Moinuddin</u> REVIEWED BY: _____																																		
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**DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED**



SEAL

NORTH CAROLINA
PROFESSIONAL
SEAL
034454
ENGINEER
GOLAM M. MOIRUDDIN

Signed by:
Golam Moiruddin
6/27/2025
DATE

SIG. INVENTORY NO. 07-2075

Prepared in the Offices of:



Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27606
License No: C-3097

750 N.Greenfield Pkwy.Garner,NC 27529

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface
Home >Controller >Overlap Configuration >Overlaps
Overlap Plan 1

Overlap	1	2	3	4
Type	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section
Included Phases	2	4	6	2
Modifier Phases	1	-	5	-
Modifier Overlaps	-	-	-	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0
FYA Ped Delay	0.0	0.0	5.0	0.0

Front Panel
Main Menu >Controller >Unit

Web Interface
Home > Controller > Unit

Modify parameters as shown below and save changes.

Start Up Parameters	Unit Flash Parameters				
<table> <tr> <td>StartUp Clearance Hold</td></tr> <tr> <td>6</td></tr> </table>	StartUp Clearance Hold	6	<table> <tr> <td>All Red Flash Exit Time</td></tr> <tr> <td>6</td></tr> </table>	All Red Flash Exit Time	6
StartUp Clearance Hold					
6					
All Red Flash Exit Time					
6					

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

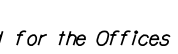
IN ORDER TO INSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

1. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
2. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
3. REMOVE FLASHER UNIT 2.

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

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Signal Upgrade - Final Design
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